

DNR HEARING - HENNING MGMT. VS. CHEVRON DAY 2

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1 STATE OF LOUISIANA  
2 DIVISION OF ADMINISTRATIVE LAW  
3 \*\*\*\*\*  
4 DEPARTMENT OF NATURAL  
5 RESOURCES  
6 NO. 2022-6003-DNR-OOC  
7 IN THE MATTER OF  
8 HENNING MANAGEMENT, LLC  
9 V. CHEVRON U.S.A., INC.  
10 \*\*\*\*\*  
11 PUBLIC HEARING  
12 BEFORE THE HONORABLE CHARLES PERRAULT  
13  
14 Taken on Tuesday, February 7, 2023  
15 DAY 2  
16 (pages 245 through ^)  
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<p>1 (PROCEEDINGS COMMENCING AT 9:04 A.M.)  2 JUDGE PERRAULT: Today's date is  3 February 7th, 2023. It's now 9:04. We're in  4 Baton Rouge at the Division of Administrative  5 Law conducting a hearing. The case before me  6 is Docket No. 2022-6003 in the matter of  7 Henning Management, LLC, versus Chevron USA,  8 Incorporated. All parties are present today  9 and I'd like them to make their appearance on  10 the record. And I'll start with me. I'm  11 Charles Perrault, administrative law judge.  12 And we'll start with Chevron.  13 MR. BRYANT: Mitchell Bryant for Chevron USA.  14 MS. RENFROE: Good morning, Your Honor,  15 members of the panel. Tracie Renfro for  16 Chevron USA.  17 MR. GREGOIRE: Good morning. Victor  18 Gregoire, for Chevron USA.  19 JUDGE PERRAULT: All right. And for --  20 MR. WIMBERLEY: Todd Wimberley, plaintiffs.  21 MR. KEATING: Matt Keating for Henning  22 Management.  23 JUDGE PERRAULT: And then we'll have the  24 panel. Just state your name and the agency  25 you're from.</p>	<p>1 THE WITNESS: C-O-N-N-E-L-L-Y.  2 THE COURT: Please take a seat.  3 MR. BRYANT: Good morning, Your Honor; good  4 morning, panel members; good morning,  5 Dr. Connelly.  6 THE WITNESS: Good morning.  7 MR. BRYANT: Before we get started, I've got  8 printed copies of Dr. Connelly's slides if  9 that would be helpful for y'all in the panel.  10 JUDGE PERRAULT: Thank you very much.  11 MR. BRYANT: For the record, these were  12 provided to plaintiffs' counsel this morning.  13 BY MR. BRYANT:  14 Q. Dr. Connelly, tell the panel a bit about  15 your background and education, please.  16 A. I have a Ph.D. in toxicology from the  17 LSU school of veterinary medicine. I have an  18 undergraduate degree in geology, and I work for  19 ERM, which is Environmental Resources Management,  20 as a toxicologist and ecological risk assessor.  21 Q. And in addition to your employment at  22 ERM, are you also employed otherwise?  23 A. Yes. I'm an adjunct faculty at LSU in  24 the department of environmental sciences.  25 Q. How long have you been teaching at LSU?</p>
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<p>1 PANELIST LITTLETON: Jessica Littleton,  2 Department of Natural Resources.  3 PANELIST DELMAR: Christopher Delmar from  4 Natural Resources.  5 PANELIST OLIVIER: Stephen Olivier,  6 Department of Natural Resources, Office of  7 Conservation.  8 PANELIST BROUSSARD: Gavin Broussard,  9 Department of Natural Resources, Office of  10 Conservation.  11 JUDGE PERRAULT: And I put a sign-in sheet in  12 the back so if at some time today, everyone  13 would sign in in the back.  14 We left off yesterday with Chevron's  15 witness, Dr. Helen Connelly. She hasn't been  16 brought up this morning yet, so Ms. Connelly,  17 please proceed. Please come up.  18 HELEN CONNELLY,  19 having been first duly sworn, was examined and  20 testified as follows:  21 DIRECT EXAMINATION  22 JUDGE PERRAULT: Please state your name for  23 the record.  24 THE WITNESS: Helen Connelly.  25 JUDGE PERRAULT: And spell your last name.</p>	<p>1 A. I've been teaching for about the last 20  2 years, but approximately the last ten years off  3 and on at LSU.  4 Q. What classes do you teach there,  5 Dr. Connelly?  6 A. Environmental science, ecological risk  7 assessment, conservation biology, environmental  8 sampling.  9 Q. So all topics that bear on your  10 testimony here today?  11 A. Yes.  12 Q. Dr. Connelly, are you a member of any  13 professional organizations that relate to  14 ecotoxicology or ecological risk assessment?  15 A. Yes. The Society of Environmental  16 Toxicology and Chemistry.  17 Q. And tell us a little bit about the  18 society of -- about CTEC.  19 A. It's pretty much the top-flight  20 organization for research in toxicology as it  21 relates to the work that I do. And specifically,  22 I'm able to find research -- I'm able to hear  23 research before it's published because, at the  24 major meetings, the scientists always talk about  25 what they're doing now but not what they have</p>

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1 published already; so I'm able to keep abreast of  
 2 toxicity and especially as it relates to the  
 3 compounds we have interest in -- metals, total  
 4 petroleum hydrocarbons, PAHs, things that we see  
 5 in the oil field.  
 6 Q. Tell us a little bit about your  
 7 experience at ERM. What kind of work have you  
 8 done?  
 9 A. I have had the good opportunity to do  
 10 very interesting work, you know, throughout South  
 11 Louisiana. My work has involved, for example,  
 12 field surveys of crustaceans, including crabs and  
 13 crawfish, rapid bio-assessments of fish  
 14 populations, vegetation surveys in marsh,  
 15 bottomland hardwood forests. So I've gotten to  
 16 see things that many people don't see. So I'm  
 17 fortunate in that.  
 18 Q. You've also done a number of risk  
 19 assessments and ecological risk assessments;  
 20 correct?  
 21 A. Yes.  
 22 Q. How many risk assessments would you say  
 23 that you performed in your career, Dr. Connelly?  
 24 A. In my career, beginning from the  
 25 beginning of any type of a risk assessment,

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1 probably about a hundred.  
 2 Q. And how about -- what has been your  
 3 focus for the last maybe ten years?  
 4 A. For the last ten years, I've been  
 5 focused on large-scale ecological risk  
 6 assessments, specifically in onshore oil field  
 7 settings.  
 8 Q. Have you also done a number of  
 9 biological field surveys in Louisiana?  
 10 A. Yes. Numerous field surveys like the  
 11 ones I described to you.  
 12 Q. And tell us a little bit about those  
 13 types of surveys.  
 14 A. Okay. So one that comes to mind that's  
 15 quite relevant to this particular setting, just  
 16 because of some of the conversation, is I did a  
 17 large rapid bio-assessment in a freshwater marsh  
 18 in Terrebone Parish that had oil field  
 19 constituents but, in particular, this was a fish  
 20 study where the barium concentrations in the  
 21 sediment reached 12,000 parts per million, and I  
 22 was able to do a study of the fish there on-site  
 23 in the oil field area as compared to a nearby  
 24 wildlife refuge.  
 25 And I had approval from the US Fish and

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1 Wildlife Services to do that study, and I also had  
 2 approval from the Louisiana Department of Wildlife  
 3 and Fisheries. So it was an opportunity for me to  
 4 look at the effects specifically of barium on fish  
 5 abundance and fish community structure. So that's  
 6 one example.  
 7 And then I did another large study in  
 8 Vermilion Parish of the crab and fish population,  
 9 also in an oil field setting, where the barium in  
 10 the sediments reached 15,000, 13,000 parts per  
 11 million. And I was able to look at crab size,  
 12 crab abundance, and also that study was weighed in  
 13 on by the Department of Health and Hospitals for  
 14 crab consumption. So those are two studies that  
 15 have some relevance here.  
 16 Q. Is it fair to say, Dr. Connelly, that  
 17 you've previously performed risk assessments that  
 18 involved the same type of ecology and the same  
 19 type of constituents that are at issue on the  
 20 Henning Management property?  
 21 A. Yes. I've done -- done my work  
 22 throughout South Louisiana in marsh settings, you  
 23 know, all the way, freshwater, brackish, saltwater  
 24 marsh, bottomland hardwood forests, and also  
 25 grasslands like we see on this property, which are

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1 very precious in Louisiana and also much smaller  
 2 in number than they have been historically, the  
 3 grasslands.  
 4 Q. How much of your work involves  
 5 Louisiana, Dr. Connelly?  
 6 A. Now it's 100 percent. Early in my  
 7 career, it was also Mississippi, Alabama, Texas.  
 8 But recently it's been Louisiana.  
 9 Q. In your work in Louisiana, have you  
 10 appeared before the DNR before?  
 11 A. Yes. This makes -- for this type of  
 12 most feasible plan hearing, this is the fifth time  
 13 I've presented my work to the LDNR panel.  
 14 Q. And which hearings have you previously  
 15 appeared in, Dr. Connelly, as an expert?  
 16 A. The Hero Lands, the LA Wetlands, the JLS  
 17 Jeanerette Lumber and then very recently the  
 18 Levert project and then now this one makes five.  
 19 Q. Were you accepted by -- let me ask you  
 20 first: Has the DNR ever rejected your ecological  
 21 risk assessment findings?  
 22 A. No.  
 23 Q. In fact, isn't it true that both the DNR  
 24 and the DEQ have accepted risk assessments that  
 25 you've performed in the past?

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1 A. Yes, that's true.  
 2 Q. Did the DNR accept you as an expert  
 3 witness in the fields of ecotoxicology, risk  
 4 assessment and wetlands sciences in the past?  
 5 A. Yes.  
 6 Q. You've also been accepted as an expert  
 7 in Louisiana courts as an expert in ecotoxicology,  
 8 risk assessment and wetland sciences; correct?  
 9 A. Yes.  
 10 MR. BRYANT: With that, Your Honor, I tender  
 11 Dr. Connelly as an expert in the areas of  
 12 ecotoxicology, risk assessment and wetlands  
 13 sciences.  
 14 MR. WIMBERLEY: No objection, Your Honor.  
 15 JUDGE PERRAULT: No objection. Dr. Connelly  
 16 will be admitted as an expert in the areas  
 17 you just stated.  
 18 BY MR. BRYANT:  
 19 Q. Dr. Connelly, did you prepare an  
 20 ecological risk assessment as part of your  
 21 investigation of the ecological condition of the  
 22 Henning Management property?  
 23 A. Yes.  
 24 Q. And for the record, that was included as  
 25 Appendix O to Chevron's most feasible plan;

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1 correct?  
 2 A. Correct.  
 3 MR. BRYANT: Your Honor, can I approach the  
 4 witness?  
 5 JUDGE PERRAULT: Yes.  
 6 BY MR. BRYANT:  
 7 Q. Dr. Connelly, I've handed you what's a  
 8 copy of Exhibit 2. Can you tell the panel what  
 9 that is?  
 10 A. This is my ecological risk assessment  
 11 for this Henning property.  
 12 MR. BRYANT: And Chevron would offer, file  
 13 and introduce Exhibit 2, which is  
 14 Dr. Connelly's risk assessment, into the  
 15 record, Your Honor.  
 16 JUDGE PERRAULT: All right.  
 17 MR. BRYANT: And I have copies of that risk  
 18 assessment for the panel if it would be  
 19 helpful.  
 20 BY MR. BRYANT:  
 21 Q. Dr. Connelly, as part of the ecological  
 22 risk assessment that's covered in that Exhibit 2,  
 23 have you evaluated the ecological condition of the  
 24 Henning Management property?  
 25 A. Yes, I have.

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1 Q. Tell the panel the process that you  
 2 followed in performing that risk assessment.  
 3 A. Right. So although that stack is very  
 4 large, I'll just give the briefest overview of how  
 5 this was performed.  
 6 The first thing I do is review the data  
 7 from -- and in this instance, it was from ICON.  
 8 So that's the original soil data that I have. I  
 9 identified the concentrations on the property that  
 10 are the most elevated. I go out to the property  
 11 with my team, and I visit those locations on the  
 12 property. And in this instance, I want to say  
 13 there were ten locations of the most elevated --  
 14 and in particular barium, because this is mostly a  
 15 barium case -- so that I could look for adverse  
 16 effects due to the constituents related to E&P  
 17 operations and see if there is an adverse effect  
 18 on the ecology. When I'm there, I collect data,  
 19 wildlife and vegetation data. I bring that back.  
 20 I have also visited with my team a reference  
 21 location for comparison, and I analyze that  
 22 vegetation and wildlife data.  
 23 Then at this point -- okay, so now I  
 24 have the ICON data, I have data from my group,  
 25 which is ERM; and in this case, it's more than

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1 5,000 data points. More than half of those were  
 2 collected by ERM, and I'm able to use -- of those  
 3 5,000 data points, I use the soil data to  
 4 calculate ecological risk, and then based on all  
 5 of those multiple lines of evidence, I make a  
 6 conclusion about ecological risk at the property  
 7 and I make a recommendation about remediation.  
 8 Q. Dr. Connelly, during their opening  
 9 statement, plaintiffs talked about following the  
 10 rules. Can you tell the panel what rules you  
 11 followed in performing your ecological risk  
 12 assessment?  
 13 A. LDEQ has a section in the RECAP document  
 14 on ecological risk assessment; and within that  
 15 section, RECAP points to the 1997 US EPA Guidance  
 16 for Risk Assessment. So that is the protocol that  
 17 I follow.  
 18 MR. BRYANT: Can I approach, Your Honor?  
 19 JUDGE PERRAULT: Yes.  
 20 BY MR. BRYANT:  
 21 Q. Dr. Connelly, I'm handing you a copy of  
 22 Exhibit 112. Can you identify that for the panel?  
 23 A. Yes. This is the 1997 US EPA Guidance  
 24 for Ecological Risk Assessment.  
 25 Q. And this is the EPA guidance that you

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<p style="text-align: right;">Page 261</p> <p>1 relied on in performing your ecological risk  2 assessment; correct?  3 A. Correct.  4 JUDGE PERRAULT: Your Honor, we'd offer and  5 introduce Chevron Exhibit 112 into the  6 record.  7 BY MR. BRYANT:  8 Q. Has there been any guidance from EPA  9 since the 1997 guidance, Exhibit 112, that you  10 used in your assessment?  11 A. So the 1997 guidance, you might think to  12 yourself: That's old, outdated. There has not  13 been an update to that document, but periodically  14 EPA issues, for example, guidance on assessing  15 metals in ecological risk assessment, guidance on  16 understanding what the biologically active zone  17 is. So EPA publishes -- and they might publish  18 something on how to analyze PAHs. So we  19 incorporate all of that into our work.  20 And the other thing that we do is,  21 because the guidance is from 1997, we look at the  22 rulings that EPA makes on large risk assessments  23 around the country so that I can see how are other  24 risk assessors analyzing their properties and  25 arriving at conclusions and what does EPA approve</p>	<p style="text-align: right;">Page 263</p> <p>1 assessment at this site?  2 A. So for my work, I do a large scientific  3 review, a review of the peer-reviewed scientific  4 literature, and in particular, I focus on barium,  5 total petroleum hydrocarbons, other metals that  6 are associated with fossil fuel production so that  7 I am updated on anything new that comes out about  8 toxicity and these compounds as it relates to the  9 environment. So I research the scientific  10 literature so that I can stay updated.  11 Q. We've discussed, Dr. Connelly, your  12 structure and the method that you follow. Now  13 let's talk about the Henning property. What  14 data -- in performing your assessment, what data  15 did you consider?  16 A. I considered all of the vegetation and  17 wildlife data that I collected, that the  18 plaintiffs' experts collected, and also data  19 collected by Dr. Holloway and Patrick Ritchie. So  20 I used all of that vegetation and wildlife data,  21 and then I used all of the soil data in the zero  22 to 4-foot interval collected by both ERM and ICON.  23 As I mentioned, it's a very large data set. I  24 think Dave Angle is going to talk about exactly  25 how big it is. But there are over 5,000 data</p>
<p style="text-align: right;">Page 262</p> <p>1 of. So that way, it's almost like the large risk  2 assessments are showing me the practice and  3 protocol of EPA, even though they haven't updated  4 the 1997 guidance.  5 Q. And those are EPA records of decision  6 that you're referring to; correct?  7 A. So I look for the record of decision  8 first to see if the risk assessment was approved  9 and then I go backwards and I find the risk  10 assessment that was approved because the record of  11 decision involves a lot of things, but the risk  12 assessment is integral of that. So I look for the  13 risk assessment.  14 Q. And did you follow the process that's  15 laid out, both in the 1997 guidance, the  16 subsequent guidance, and these records of decision  17 that you just referenced in your risk assessment  18 on the Henning Management property?  19 A. Yeah. I weave all of that in so that  20 we're using the best current science and the best  21 current practice for our ecological risk  22 assessments.  23 Q. In addition to regulatory guidance,  24 Dr. Connelly, what scientific sources have you  25 relied on in performing your ecological risk</p>	<p style="text-align: right;">Page 264</p> <p>1 points. Now, not all of that related to our work,  2 but we did use all soil data, metals, all  3 hydrocarbons in the zero to 4-foot interval.  4 Q. So to be clear, you reviewed and  5 analyzed the data that was collected by ICON;  6 correct?  7 A. Yes.  8 Q. You also, Dr. Connelly, reviewed and  9 analyzed the data collected by plaintiffs' expert  10 CEI?  11 A. Yes.  12 Q. Who went out and reviewed the vegetation  13 on the property?  14 A. Yes.  15 Q. Do you think it's important to consider  16 all the available data when performing your risk  17 assessment?  18 A. I do think it's important to consider  19 all available data. Number 1, more data gives a  20 more correct answer. So you get closer to the  21 truth if you analyze all of the data. And the  22 other thing is, the Louisiana Department of  23 Environmental Quality requires that if you are  24 going to disregard a data set, you have to  25 describe in writing why you did that. Now, the</p>

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1 agencies don't want data used that's not  
 2 validated, but if it's a validated data set from a  
 3 certified -- you know, an LDEQ-certified lab or  
 4 LDNR-certified lab, that data should be used in  
 5 the assessment.  
 6 Q. In your experience, your decades of  
 7 experience performing risk assessments,  
 8 Dr. Connelly, is it appropriate to ignore an  
 9 available and validated data set?  
 10 A. No. It's all information. It should be  
 11 included.  
 12 Q. Dr. Connelly, in addition to considering  
 13 the available data, did you also confer with  
 14 Chevron's other experts regarding the Henning  
 15 Management property?  
 16 A. Yes, I did.  
 17 Q. And why is that important?  
 18 A. It's important for me to talk to other  
 19 experts who are outside of my area of expertise.  
 20 So for example, I'm not a groundwater expert, I'm  
 21 not a remediation expert or, for example, root  
 22 zone expert. So if I need to know how deep is the  
 23 rooting depth at the property, I consult with  
 24 Patrick Ritchie. If I need to understand: Does  
 25 the groundwater interact with the surface, I

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1 consult with Dave Angle. That's why I talk to  
 2 other experts.  
 3 Q. So is it fair to say that between the  
 4 process that you followed, the various data that  
 5 you considered, your consultations with other  
 6 experts, you followed multiple lines of evidence  
 7 to evaluate the ecological conditions on the  
 8 Henning Management property?  
 9 A. Yes, I did.  
 10 Q. I want to discuss all those lines of  
 11 evidence in detail as we go through your  
 12 presentation. But before we do that, based on  
 13 those multiple lines of evidence, what conclusions  
 14 did you reach about the Henning Management  
 15 property?  
 16 A. So this is just sort of a broad overview  
 17 of my conclusions. I concluded that the property  
 18 is a mosaic of habitats, including grasslands,  
 19 wetlands, scrub-shrub and also croplands. I  
 20 concluded that the property is functioning as  
 21 expected for the region as compared to references  
 22 at nearby refuges and also references from the  
 23 Department of Wildlife and Fisheries. I  
 24 determined that, per my quantitative ecological  
 25 risk assessment performed per EPA protocol, that

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1 there is no evidence of risk to the wildlife on  
 2 the property; and, based on all of these lines of  
 3 evidence, my conclusion is heavily weighted that  
 4 there is no risk at the property associated with  
 5 the ecology and no remediation is required for  
 6 ecological reasons at the property.  
 7 Q. So to reiterate that, Dr. Connelly,  
 8 whether remediation is needed for other reasons  
 9 potentially, there is no ecological need to  
 10 perform a remediation on the Henning Management  
 11 property?  
 12 A. Correct.  
 13 Q. And we'll talk about this more in detail  
 14 later, but is it fair to say that a remediation  
 15 can actually cause harm to the ecology of the  
 16 Henning Management property?  
 17 A. Yes. There's risk associated with  
 18 remediation. So if a remediation is performed,  
 19 there has to be a balance and there has to be  
 20 evidence that the risk or the damage caused to the  
 21 property by the remediation outweighs something  
 22 else. So the take-home is there is a risk  
 23 associated with remediation, and there has to be a  
 24 very good reason to do it because it will have  
 25 effects on the environment.

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1 Q. So Dr. Connelly, I'd like to discuss now  
 2 the process that you followed and step through the  
 3 various steps that you took, starting with your  
 4 site investigation. And so did you collect and  
 5 analyze field data as part of your ecological  
 6 assessment?  
 7 A. Yes, I did.  
 8 Q. Did you do it on your own or did you  
 9 lead a team that performed that assessment?  
 10 A. I have a team that works with me in the  
 11 field. That picture up there at the top is me at  
 12 the Henning property. Just below is Emily Martin,  
 13 and she is a specialist in endangered species,  
 14 both plants and animals. She was with me. And  
 15 then at the bottom is Jody Shugart. He is a  
 16 naturalist and a field biologist, and he took --  
 17 if you see photographs of birds in this  
 18 presentation, he's a bird photographer. And then  
 19 I took the photographs of the landscape.  
 20 Q. That's a good point, Dr. Connelly. Did  
 21 you take this photograph on the Henning Management  
 22 property?  
 23 A. Yes. I took that photograph at the  
 24 blowout pond.  
 25 Q. Let's discuss your site investigation.

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1 When did that occur?  
 2 A. I visited the property in January of  
 3 2022. Jody went to the property prior,  
 4 March of 2021. And then I went back and did  
 5 another visit in April 2022 and then again in  
 6 June 2022.  
 7 Q. How did you determine which sites on the  
 8 Henning Management property to visit,  
 9 Dr. Connelly?  
 10 A. I visited the locations of maximum  
 11 constituent concentration. And at this property,  
 12 which I think the panel is aware, the primary  
 13 constituent is barium. So I visited the locations  
 14 of maximum barium concentration and then I also  
 15 visited any locations where the plaintiffs had  
 16 called out a claim of impact to the ecology.  
 17 Q. So is it fair to say, Dr. Connelly, just  
 18 to reiterate, you went to the maximum locations of  
 19 barium, lead, mercury, the highest concentrations  
 20 on the property, and you also went to the areas  
 21 that plaintiffs claimed were most impacted by oil  
 22 field operations?  
 23 A. Yes. And the reason I do that is I --  
 24 I, in advance, think: If I visit the locations of  
 25 maximum concentrations and look for adverse

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1 impacts there, I can make conclusions about the  
 2 rest of the property. So it informs my decision  
 3 to go to sort of the worst case scenario.  
 4 Q. And in your site investigation, did you  
 5 also visit each of the Chevron limited admission  
 6 areas?  
 7 A. Yes.  
 8 Q. Once you decided the areas to visit,  
 9 Dr. Connelly, describe the method that you  
 10 followed in each location to perform your site  
 11 investigation.  
 12 A. At each location, we do a 30-foot radius  
 13 survey where we record, to genus and species, all  
 14 of the plants and animals that we observe. We do  
 15 an investigation for adverse effects. Frequently  
 16 we look for salt effects because that's usually  
 17 part of a plaintiff claim as well, and we  
 18 photograph the area and we also visit a reference  
 19 location. In this instance, it was Lacassine  
 20 National Wildlife Refuge. And we visit locations  
 21 that are similar habitats and do a survey at that  
 22 location as well to draw a comparison.  
 23 Q. We're going to walk through each of  
 24 these areas that you've got featured on this  
 25 slide; but before we do, I'd like to give an

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1 overview to the panel of this property. You're  
 2 aware that drone video was taken; correct,  
 3 Dr. Connelly?  
 4 A. Yes.  
 5 Q. And you've reviewed that video?  
 6 A. Yes.  
 7 Q. I'm going to play a clip of that video  
 8 and I'd like you to describe to the panel what it  
 9 is that we're seeing.  
 10 A. So this is an American alligator, an  
 11 inhabitant of the blowout pond, along with fish  
 12 and other reptiles, snakes.  
 13 This is Area 4. It's primarily  
 14 grasslands, which this is part of the coastal  
 15 prairie area. We saw deer and rabbits in these  
 16 grasslands.  
 17 This is Area 5. It is exceptionally  
 18 diverse in grasses, and we also saw emergent marsh  
 19 and multiple birds.  
 20 This is Area 6. It's a forested  
 21 scrub-shrub area. And you can see the former  
 22 footprint of operations to the north.  
 23 And Area 8 is planted in rice. You can  
 24 see the great egrets hunting for invertebrates and  
 25 fish because there's standing water within that

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1 rice. It's a working wetland, and it provides  
 2 diet for multiple species that we saw. And there  
 3 is a great egret traveling towards the forest that  
 4 borders the rice crops.  
 5 Q. Dr. Connelly, I'd like to take a detour  
 6 before we go to each of the areas that you  
 7 visited. Based on that video, your site visits,  
 8 all the data that you collected and analyzed, how  
 9 is this site currently being used?  
 10 A. The site is currently being used for  
 11 recreational purposes as well as growing rice and  
 12 then -- yeah, and then also undeveloped as well.  
 13 Q. We've heard a lot of discussion about  
 14 the potential future uses of the property. Did  
 15 you consider potential future uses to the property  
 16 and how did you know what potential future uses to  
 17 consider?  
 18 A. I did consider future use of the  
 19 property. It's always part of my ecological risk  
 20 assessment. I did read a deposition by the owner,  
 21 the landowner, Tom Henning, and he described that  
 22 his plans for future use of the property involved  
 23 farming and recreational hunting.  
 24 Q. And just to reiterate, Dr. Connelly,  
 25 when you say "recreational purposes," hunting is

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1 what you mean?  
 2 A. I do.  
 3 Q. So to clarify, Mr. Henning has given  
 4 sworn testimony under oath about his future  
 5 potential uses of the property; correct?  
 6 A. That's the deposition that I read.  
 7 Q. And is there any -- would any of those  
 8 land uses that he described be precluded by the  
 9 ecological condition of the Henning Management  
 10 property?  
 11 A. No. The ecological conditions do not  
 12 preclude -- I think is the word you used?  
 13 Q. Yes.  
 14 A. -- any of the uses on the property.  
 15 Q. Let's walk through your site  
 16 investigation, Dr. Connelly. Where is this on the  
 17 property?  
 18 A. This is the blowout pond. This is  
 19 Area 2.  
 20 Q. And did you take this photo?  
 21 A. I did.  
 22 Q. And so I assume it accurately reflects  
 23 your observation at the property?  
 24 A. Yes.  
 25 Q. And tell the panel a little bit about

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1 the plants and wildlife in the vicinity of this  
 2 H-11 and 12 A survey location in Area 2.  
 3 A. What you see in the forefront of the  
 4 image is a black willow, which is an obligate  
 5 wetlands species dedicated to wetlands. You can  
 6 see the cattails, also obligate wetlands species.  
 7 And around the blowout pond, I saw lots  
 8 of evidence that the pond is supporting fish based  
 9 on the bird, fish predators, including the little  
 10 blue heron. And I saw evidence -- I saw the  
 11 northern harrier, which eats mammals. So that  
 12 makes me think that there are mammals living in  
 13 this area. And then we also saw the alligator,  
 14 which eats mostly fish and crawfish but also other  
 15 mammals and reptiles. So I saw a diversity of  
 16 bird species and also exceptional plant species as  
 17 well.  
 18 Q. Is this an area on the property where  
 19 chlorides are elevated, Dr. Connelly?  
 20 A. Yes.  
 21 Q. Did you see -- well, let me ask you:  
 22 How do you evaluate properties for chloride  
 23 impacts?  
 24 A. I look for specific things for chloride  
 25 impacts. I look for areas denuded of vegetation.

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1 I look for plants that are sensitive to chlorides,  
 2 meaning they couldn't live there if there were  
 3 elevated salts. I look for damage or stunting to  
 4 plants. So we did that investigation. I didn't  
 5 find any of that evidence. You said that there's  
 6 elevated chlorides. There are but in the surface  
 7 soils in this area, the salt parameters are very  
 8 low, so I wasn't surprised that there were not --  
 9 there wasn't salt damage.  
 10 Q. So in other words, Dr. Connelly, your  
 11 review of the vegetation at this location and at  
 12 other locations is consistent with the sampling  
 13 data on the property that shows a lack of elevated  
 14 salt parameters?  
 15 A. Correct.  
 16 Q. Now, are there any impacts that you  
 17 observed to wildlife or vegetation at this  
 18 location from oil and gas-related constituents?  
 19 A. No.  
 20 Q. And in fact, do these pictures show an  
 21 area that's slated for remediation, Dr. Connelly?  
 22 A. Yes.  
 23 Q. Let's move on to your next area. This  
 24 is Area 4; correct?  
 25 A. Correct.

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1 Q. And did you also take this photograph?  
 2 A. I did.  
 3 Q. And tell the panel about the plants and  
 4 wildlife in the vicinity of the H-8 location in  
 5 Area 4.  
 6 A. This area is primarily grasslands, and  
 7 I've called out on this slide for you that we  
 8 observed the bushy blue stem. Some of you may  
 9 know that grass. It's native to Louisiana, and  
 10 it's especially attractive to deer. And we did  
 11 see a deer hiding in these grasses.  
 12 Q. And is this an area where barium  
 13 concentrations are elevated?  
 14 A. Yes.  
 15 Q. And we'll talk more about barium in a  
 16 moment, but did you see any effects from the  
 17 elevated barium concentrations at this location on  
 18 the plants or wildlife in this area?  
 19 A. No.  
 20 Q. You mentioned, Dr. Connelly, that --  
 21 before we go there, the barium at this location,  
 22 is this one of the locations where you performed  
 23 speciation testing?  
 24 A. Yes. The barium concentration at this  
 25 location is 7,000 parts per million. That's the

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1 maximum location -- the maximum concentration in  
 2 this location, and that is approximately how high  
 3 barium is on the property in locations of maximum  
 4 concentration. So this is an example of that.  
 5 And we did barium speciation here, using XRD and  
 6 EDX analysis.  
 7 Q. And what were the results of that  
 8 speciation analysis?  
 9 A. The XRD analysis showed that the only  
 10 form of barium on the property is barium sulfate,  
 11 which is of very low toxicity, very low water  
 12 solubility, very low bioavailability, essentially  
 13 inert, or very nonreactive.  
 14 Q. Is that consistent with your experience  
 15 at other oil and gas exploration and production  
 16 sites?  
 17 A. Yes. Barite is the form of barium that  
 18 we see in oil field areas, and it is the form of  
 19 barium that, in a geochemical sense, exists at  
 20 this pH.  
 21 Q. So Dr. Connelly, from those barium  
 22 concentrations or from any other oil field  
 23 constituents, did you see any evidence of adverse  
 24 impacts at this location?  
 25 A. No, I didn't.

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1 Q. Let's move on to the next area. Where  
 2 is this on the property, Dr. Connelly?  
 3 A. This is Area 5. It's south of that  
 4 Area 4 that we were just looking at.  
 5 Q. Did you also take this photograph?  
 6 A. I did.  
 7 Q. And tell the panel a little bit about  
 8 the plants and wildlife in the vicinity of this  
 9 11 A survey location in Area 5.  
 10 A. So called out on this slide for you, I  
 11 put the word "conservation," and I list sandhill  
 12 crane and sedge wren. Those are two species of  
 13 greatest conservation need as called out by the  
 14 Louisiana Department of Wildlife and Fisheries,  
 15 meaning those birds have either limited habitat or  
 16 declining populations. So it identifies this  
 17 Henning property as an area for conservation  
 18 habitat for bird species, and what's especially  
 19 interesting about the sandhill crane -- both the  
 20 sandhill crane and the sedge wren are migratory  
 21 species. The sandhill crane is known in Louisiana  
 22 to migrate in both the Mississippi Flyway and the  
 23 Central Flyway, and the Henning property is  
 24 situated at the convergence of the Mississippi  
 25 Flyway and the Central Flyway. So it is a

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1 location where many birds travel and use these  
 2 grasslands and these wetlands as stop-overs in  
 3 their migration pattern.  
 4 Q. So this is a -- is it fair to say that  
 5 this property has ecological importance not just  
 6 in and of itself but to the wider regional  
 7 ecosystem?  
 8 A. Yes. This property is within what's  
 9 called an important bird area, IBA. It's an area  
 10 of conservation for birds. And it's also called  
 11 out by EPA as an ecological hub along with the  
 12 Lacassine National Wildlife Refuge that is to the  
 13 east. So its position, especially in the  
 14 migratory, the Mississippi Flyway and the Central  
 15 Flyway, makes it very important for the bird  
 16 populations in Louisiana and something to be  
 17 treasured.  
 18 Q. And Dr. Connelly, just something to --  
 19 follow-up question to something you just said, you  
 20 mentioned that this is grasslands and emergent  
 21 wetlands. And while this may not be a cypress  
 22 swamp or some other kind of landscape that you've  
 23 talked about a little bit, why is this an  
 24 important habitat to preserve?  
 25 A. Right.

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1 THE WITNESS: And I think the panel has  
 2 visited the Henning property?  
 3 PANELIST OLIVIER: Yes.  
 4 THE WITNESS: Yes. Okay.  
 5 A. So I just wanted to call out -- and I  
 6 know, as scientists, you know this. But when you  
 7 visit a property like this, when you don't see a  
 8 cypress swamp or you don't see a bottomland  
 9 hardwood forest, I don't want the grasslands that  
 10 are present on this property to be dismissed,  
 11 because they are a habitat for numerous birds and  
 12 mammals. You know, we saw nine different mammals  
 13 on the property. We saw ten different birds of  
 14 greatest conservation need. And my co-worker,  
 15 Jody, who photographs birds, whenever we approach  
 16 the grasslands, he makes me be really still and  
 17 quiet because that's where he'll see an abundance  
 18 of birds. So I just wanted to call out that these  
 19 grasslands are precious and are a treasure in our  
 20 state and worth protecting.  
 21 BY MR. BRYANT:  
 22 Q. And let's move on. Let's continue  
 23 talking about the property and the important  
 24 habitat that it's made up of.  
 25 Where is this on the property,

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1 Dr. Connelly?

2 A. This is in Area 6, which is south of the

3 croplands. And it is characterized as a scrub --

4 shrub-scrub forest. In this area, we saw numerous

5 insectivorous song birds. They use this habitat.

6 And we also saw evidence of raccoons, and this was

7 an area of actually exceptional plant species. We

8 saw 37 different plants -- different unique plants

9 in this area.

10 Q. And this, again, is a photo that you

11 took; correct?

12 A. Yes.

13 Q. And tell the panel about the barium

14 concentrations at this H-24 survey location in

15 Area 6.

16 A. In Area 6, barium is elevated in the

17 soil, and that made it an area that I wanted to

18 visit to see if I saw adverse impacts to the

19 biodiversity to the plants or to the animals.

20 Q. And did you see any of those impacts?

21 A. No.

22 Q. Let's move on to the last area that

23 we're going to focus on this morning. Where is

24 this on the property, Dr. Connelly?

25 A. This is in Area 8. It's sort of to the

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1 north, and it is planted in rice.

2 Q. And did you, again, take this photo?

3 A. I did.

4 Q. And tell the panel about the plants and

5 the wildlife in the vicinity of this H-4 location

6 that you photographed and that you observed.

7 A. So this is planted in rice, and -- which

8 you know is a monoculture. And around the edges

9 of the rice crop, we counted the weeds, the herbs,

10 the shrubs, the vines and really saw exceptional

11 diversity around the edges of the rice crop. Of

12 course, the rice is essentially rice, but it's a

13 working wetland that attracts numerous birds. We

14 saw the bald eagle, we saw the little blue heron.

15 There are lots of animals that depend on the rice

16 for their diet. We saw the red-shouldered hawk,

17 which eats mammals. And the -- it is sort of --

18 it's interesting to see how many animals actually

19 depend on the rice fields. And I have another

20 slide about that soon.

21 Q. And we'll get to that in a minute. But

22 this is the area, when you showed the drone

23 footage a moment ago, where you saw the great

24 egrets using this field and the wetlands adjacent;

25 correct?

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1 A. Yes, they were either hunting for

2 invertebrates or fish.

3 Q. How do the barium concentrations at this

4 location compare to the barium concentrations

5 across the property?

6 A. So this single location, H-4, has the

7 highest barium concentration in the zero to 4-foot

8 interval. It is just slightly higher than

9 7,000 milligrams per kilogram dry-weight barium

10 right here at this location.

11 Q. And did you see any impacts from that

12 barium or from any other E&P constituent to the

13 vegetation at this location?

14 A. I didn't.

15 Q. And that includes the rice; correct?

16 A. Absolutely.

17 Q. So no impacts that you observed during

18 your investigation to the rice that's growing in

19 this Area 8 location?

20 A. That's correct.

21 Q. And did you see any effects on wildlife

22 from the constituent concentrations at Area 8?

23 A. No. I would say the opposite is true.

24 I saw evidence of abundant wildlife using these

25 working wetlands.

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1 Q. Well, let's talk about barium

2 concentrations and how you analyzed those on the

3 property.

4 In addition to looking at the number of

5 locations that we just discussed and the barium

6 concentrations there, did you quantitatively

7 analyze how the barium concentrations may effect

8 vegetative diversity?

9 A. Yes.

10 Q. And tell the panel about the results of

11 that analysis.

12 A. Okay.

13 THE WITNESS: And Judge, can I just pop up

14 here and show them?

15 JUDGE PERRAULT: Yes.

16 A. This might be a little easier to follow

17 if I just show you this.

18 If you notice, across the top, I've

19 listed the number of different plant species from

20 low to high, and it goes from 17, then it goes 36,

21 37, 38, 39. So they're all similar except for

22 this.

23 The reason this is lower is I only did

24 one survey there in January. These other

25 locations, I did three surveys each. But these

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<p style="text-align: right;">Page 285</p> <p>1 diversity counts of plants are very similar to the  2 Lacassine National Wildlife Refuge nearby. So it  3 lets me know that the plant diversity is as  4 expected for the region. And then if you'll  5 notice down here on the bottom -- and this is why  6 I did this. When I visited this property, I  7 realized that it was a unique situation in that  8 barium really is the only constituent of concern  9 here. There's not something else at play getting  10 in the way. So I thought to myself: This would  11 be a great opportunity to see: What is the effect  12 of barium on wildlife diversity and on plants.  13       And what you can see down here at the  14 bottom is that the species count for plants is  15 unrelated to the barium concentration because, as  16 you see, you can have more than 7,000 parts per  17 million barium and 38 different unique plant  18 species. And that's similar to around 3,000 parts  19 per million and similar, as you go down.  20       So this is something I was glad I had a  21 chance to look at.  22 BY MR. BRYANT:  23       Q. And to sum up your observations,  24 Dr. Connelly, is there any evidence of a  25 relationship between barium concentrations and the</p>	<p style="text-align: right;">Page 287</p> <p>1 indicators on this property?  2       A. Yes. So for example, in the crop area,  3 the EC in the top zero to 2 feet in the  4 biologically active zone for the rice, the EC is  5 less than 1 millimho per centimeter. So there's  6 no evidence of salt impact in the crop area. And  7 then the same thing true throughout the property:  8 The average EC in the top soils is low. It's less  9 than about 2 millimhos per centimeter. So there's  10 no evidence of salt impact at the property.  11       Q. To sum up the first line of evidence  12 that you looked at regarding vegetation, based on  13 that site investigation, what conclusions were you  14 able to draw about the property?  15       A. Based on my field investigation of the  16 vegetation, I saw the plant species I expected to  17 see, I saw the diversity that is expected for the  18 region, and I did not see evidence of adverse  19 impact. And I saw the ecosystem functioning as  20 expected for grasslands, croplands and emergent  21 wetlands.  22       Q. Now, Dr. Connelly, let's move, still on  23 your site investigation but talking about  24 wildlife.  25       Did you analyze the wildlife that you</p>
<p style="text-align: right;">Page 286</p> <p>1 biodiversity on the Henning Management property?  2       A. Not that I saw.  3       Q. Now, you also -- you also  4 investigated -- and you discussed this a little  5 bit -- potential salt impacts on the Henning  6 Management property; correct?  7       A. Yes.  8       Q. How did you go about investigating the  9 property for salt impacts?  10       A. So per EPA guidance and per RECAP  11 guidance, part of the field investigation is to  12 look for evidence of adverse impacts, including  13 salt. So when I go to a property, I look for  14 damage to the plants, like browning or yellowing.  15 I look for areas that have no vegetation. I look  16 for species that are missing that should be  17 present. And so in this instance, I'm looking for  18 salt impacts. I look for plants that are  19 sensitive to salt that wouldn't grow if the salt  20 was there. And I saw many plants that would not  21 be present if salt were in their way.  22       So my conclusion is that there is no  23 evidence of salt impact at this property.  24       Q. And again, is that consistent with the  25 data relating to chlorides and other salt</p>	<p style="text-align: right;">Page 288</p> <p>1 saw when considering the ecological state of the  2 Henning Management property?  3       A. Yes, I did.  4       Q. And can you provide the panel with an  5 example of how you went about doing that?  6       A. So one of the parts of doing a field  7 investigation is to look and see with your own  8 eyes all members of the food chain from the  9 primary consumers all the way up to the top  10 predators.  11       And on this property, you know, there  12 are several different food chains you can look  13 for, beginning with detritus and moving to  14 crawfish and up the food chain. But on this  15 property, because of the rice crops, I was able to  16 see a complete avian food chain that depends on  17 the rice crop. So, for example, the red-tailed  18 hawk hunts ducks that land on the rice fields.  19 And the killdeer feeds on invertebrates in the  20 rice field, which are the benthic invertebrates,  21 the worms and the snails and other crustaceans.  22 And then the greater white-fronted goose, that is  23 a migratory bird and also common in Louisiana,  24 feeds on the waste rice and the rice grains and  25 the rice seeds. So I was able to see all members</p>

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1 of the avian food chain that use the rice crops.  
 2 Q. And what does -- what does your  
 3 observation of intact food chains, including this  
 4 avian food chain, tell you about the ecological  
 5 state of the Henning Management property?  
 6 A. The intact food chain tells me that the  
 7 whole system is functioning, and especially when I  
 8 see an abundance of top predators, because for the  
 9 bird population, when I see the American kestrel,  
 10 when I see the peregrine falcon, different hawks,  
 11 the bald eagles, that tells me that their diet is  
 12 present, meaning the fish, the mammals, the birds  
 13 that they feed on. So if those top predators that  
 14 have a high-calorie diet, a very expensive diet,  
 15 are supported, then you know the bottom of the  
 16 food chain is supported.  
 17 Q. Now, in addition to looking at food  
 18 chains and your other wildlife observations,  
 19 Dr. Connelly, you also performed the same analysis  
 20 to determine whether barium concentrations had any  
 21 impact on avian diversity; correct?  
 22 A. Correct.  
 23 Q. Tell the panel about that investigation.  
 24 A. Okay.  
 25 THE WITNESS: And, Judge, can I walk up here?

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1 JUDGE PERRAULT: Yes, please.  
 2 THE WITNESS:  
 3 A. Okay. So this graphic is set up a  
 4 little bit differently. What I did on this one is  
 5 I put, at the bottom, barium is increasing. It  
 6 starts here at around 1,000 parts per million dry  
 7 weight, and then it goes up to greater than 7,000  
 8 parts per million dry weight. So at each of these  
 9 locations, we did a wildlife survey and you'll  
 10 notice that we saw an abundance of birds at each  
 11 of these locations regardless of the barium  
 12 concentration, which tells you that the diet for  
 13 the birds is available at that location and that  
 14 the barium concentration is not diminishing that  
 15 diet.  
 16 The other thing that's not really shown  
 17 here -- I have some different song birds and I  
 18 have some migrating birds, but at these locations  
 19 of maximum barium concentration, I also saw the  
 20 predatory birds, including the hawks and the  
 21 peregrine falcons at these locations of maximum  
 22 barium concentration, which gave me a lot of  
 23 confidence about the diet that was available for  
 24 those birds.  
 25 BY MR. BRYANT:

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1 Q. Dr. Connelly, are your observations that  
 2 you made in relation to vegetation and in relation  
 3 to wildlife in relation to barium, is that  
 4 consistent with your finding that the barium on  
 5 the property is barium sulfate?  
 6 A. Yes.  
 7 Q. Why is that?  
 8 A. Because barium sulfate is a very limited  
 9 toxicity, very limited water solubility, very  
 10 limited bioavailability, and so it is actually  
 11 only poorly absorbed by plants and animals and,  
 12 therefore, of very limited toxicity.  
 13 So to answer your question, the reason  
 14 the thriving wildlife supports my conclusion that  
 15 7,000 parts per million represents barium sulfate  
 16 is barium sulfate is of low toxicity.  
 17 Q. So Dr. Connelly, to sum up this first  
 18 line of evidence as it relates to wildlife, tell  
 19 the panel the conclusions that you reached about  
 20 wildlife on the property based on your site  
 21 investigation.  
 22 A. Okay. So the conclusions I reached are  
 23 that the -- in particular, I saw an abundance of  
 24 birds. We also saw an unusually high number of  
 25 mammals because mammals tend to hide. We saw

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1 evidence of nine different mammals, including  
 2 coyote tracks. And we also talked to people on  
 3 the property that said that I heard coyotes  
 4 howling. We saw evidence of feral hogs. We saw  
 5 the deer. We actually saw that. We saw the  
 6 evidence of raccoons. So the wildlife that we  
 7 observed in the field is as expected for the  
 8 region and what I expected and hoped to see on the  
 9 property.  
 10 Q. Now let's talk now about another line of  
 11 evidence. So after you went out to the property,  
 12 you counted the number of species, the number of  
 13 plants, animals. Did you perform a quantitative  
 14 assessment of that data?  
 15 A. Yes.  
 16 Q. Tell the panel about that.  
 17 A. Okay.  
 18 Q. And maybe let's start -- let me ask a  
 19 better question.  
 20 One part of that is that you performed a  
 21 comparison between this property and the Lacassine  
 22 National Wildlife Refuge?  
 23 A. Correct.  
 24 Q. So to set the stage for this evaluation,  
 25 tell the panel a little bit about the Lacassine

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1 Refuge.

2 A. Oh, the Lacassine Refuge is a few miles

3 east of the property and we did surveys in

4 management unit A and management unit B, which

5 were similar in habitat to the property, and those

6 were 5 miles from the property and 9 miles. And

7 that Lacassine National Wildlife Refuge is also

8 considered within the ecological hub by the US

9 EPA, and it's also connected by a wildlife

10 corridor to the Henning Management property. So

11 potentially analysts could travel back and forth

12 between the properties. So it is an appropriate

13 reference to determine if the property is

14 functioning as it should when I compare it to

15 Lacassine.

16 Q. And before I move on, just to pick on

17 one thing you've said there, Dr. Connelly, this

18 property is important, again, not just in and of

19 itself, but to the regional ecosystems and the

20 regional ecology of this area of Louisiana?

21 A. Yes, definitely.

22 Q. So describe, now that we've set that

23 stage, your habitat evaluation of the Henning

24 Management property.

25 A. Okay. So I'll start with actually --

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1 I'll start with the wildlife. It's on the bottom

2 of the screen. You can see there I put the avian

3 food chain. That is what I observed on the

4 property, and you'll see that it is primarily

5 secondary consumers, and those are birds that

6 generally eat insects and that is what we expect

7 in South Louisiana, is that those secondary

8 consumers make up the largest percentage of the

9 observed bird population. You'll notice that

10 26 percent of the birds we observed are top

11 predators. That is an impressive number of top

12 predators. Usually we see anywhere from

13 17 percent to maybe 24 percent. So 26 percent top

14 predators indicates that there's a sufficient diet

15 for the top of the food chain and then you'll

16 notice that the primary consumers -- those are the

17 ones that eat seeds, nuts, grasses, fruits --

18 those make up 14 percent. That is always the

19 smallest percentage of the observed bird

20 population, and it can be as small as 5 or

21 10 percent, but my opinion is, at this property,

22 because it's so diverse with vegetation, that it

23 attracts birds that are dedicated to grasslands

24 like the meadow lark and other birds that you find

25 dedicated to grassy areas.

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1 So the avian food chain is functioning

2 well at the property. We saw ten different

3 species of greatest conservation need, which makes

4 the property conservation habitat. We observed

5 more -- we observed 70 different species of birds,

6 which is good bird diversity, and then 132

7 different wildlife species altogether, including

8 the birds.

9 And then I'll just move right into the

10 vegetation assessment. This is -- I can give you

11 a strong comparison here to the Lacassine National

12 Wildlife Refuge. At the property, 80 --

13 80 percent of the vegetation that I saw at

14 Lacassine, we also saw at the property. So it let

15 me know that the species that should be in this

16 region are present at the property.

17 I also saw almost exactly the same

18 percentage of wetlands species at Lacassine as

19 compared to the property, meaning plants that are

20 dedicated to a wetland setting, obligate,

21 facultative. And then I had also the same

22 percentage at the property of woody vegetation,

23 like trees, scrub-shrub and then balance is

24 grasses. And I saw the same thing at Lacassine,

25 so there was really a remarkable equivalency of

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1 the vegetation that was present.

2 Q. What does the equivalency that you just

3 mentioned between both vegetation and wildlife

4 tell you about the health of the Henning

5 Management property?

6 A. It tells me that the property is

7 functioning as expected for the region as compared

8 to the Lacassine reference, and I also compared to

9 Louisiana Department of Wildlife and Fisheries'

10 documented references. So it tells me that the

11 property is functioning, the ecosystem is

12 functioning as expected and, although there was

13 oil field activity, I do not see damage to the

14 ecology on the property.

15 Q. And before I forget to ask, did you take

16 this photo?

17 A. Jody took that photo.

18 Q. And this is wildlife that's on the

19 Henning Management property?

20 A. Yes.

21 Q. Before we move on to -- we're going to

22 move from your habitat and site investigation to

23 your quantitative risk assessment.

24 A. (Nods head.)

25 Q. But before we do that, can you just sum

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1 up for the panel the conclusions that you reached  
 2 based on your field work and your analysis of that  
 3 field data?  
 4 A. Yeah. So the summary of my conclusion is  
 5 that the community structure of the bird  
 6 population is as expected, the vegetation on the  
 7 property is actually exceptionally diverse. I  
 8 mean, we counted over -- we counted 193,000  
 9 different vegetative species, which is  
 10 exceptional. The property is precious in that it  
 11 has grasslands, which are limited in the state of  
 12 Louisiana. And the property is not showing  
 13 adverse effects to the biodiversity or to the  
 14 abundance. Yes, biodiversity and abundance of  
 15 wildlife on the property and vegetation.  
 16 Q. All right, Dr. Connelly. Thank you for  
 17 that. And let's move now into your quantitative  
 18 risk assessment. And did you -- as part of that  
 19 quantitative risk assessment, did you evaluate  
 20 whether conditions on the Henning Management  
 21 property pose a risk of adverse ecological effects  
 22 going forward?  
 23 A. Yes.  
 24 Q. Let's step through that analysis. What  
 25 regulations did you rely on to guide your

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1 ecological risk assessment?  
 2 A. I used the EPA eight-step process for  
 3 ecological risk assessment.  
 4 Q. And is that what's shown on the screen  
 5 here?  
 6 A. Yes.  
 7 Q. And to be clear, Dr. Connelly, this  
 8 process comes from that Exhibit 112, the 1997 EPA  
 9 guidance that you mentioned?  
 10 A. Yes.  
 11 Q. And so this is an EPA-approved process  
 12 for performing quantitative risk assessments?  
 13 A. Correct.  
 14 Q. Give a high-level overview for the  
 15 panel -- there's a lot of words, a lot of science  
 16 here. Give a high-level overview for the panel of  
 17 how this eight-step process works.  
 18 A. Okay. Steps one and two are a screening  
 19 process. Any constituents in soil that exceed  
 20 that screening process move forward into what's  
 21 called the baseline ecological risk assessment,  
 22 which is steps three through seven. That's the  
 23 quantitative part. That's where risk is  
 24 calculated. And then, based on that calculation,  
 25 step eight is a proposal as to whether or not

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1 remediation is needed to protect the ecology.  
 2 Q. What site media did you take through  
 3 this eight-step screening process?  
 4 A. Soil.  
 5 Q. Why did you consider soil?  
 6 A. That's what's recommended in the EPA  
 7 guidance.  
 8 Q. Why did you not consider groundwater on  
 9 the Henning Management property?  
 10 A. Per my conversations with Dave Angle and  
 11 Mike Purdom, the groundwater does not interact  
 12 with the surface, so the wildlife do not have  
 13 access to it, so it's an incomplete pathway.  
 14 Q. So regardless of whether the groundwater  
 15 is Class 2, Class 3, usable, unusable, it doesn't  
 16 have an effect on the ecology of this property;  
 17 right?  
 18 A. That's right.  
 19 Q. What were the constituents that you  
 20 considered in soil as part of your ecological risk  
 21 assessment?  
 22 A. I considered metals that are associated  
 23 with fossil fuels, and I considered the total  
 24 petroleum hydrocarbons that are the fossil fuels  
 25 themselves.

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1 Q. Did you take all of those constituents  
 2 through a screening level ecological risk  
 3 assessment?  
 4 A. Yes.  
 5 Q. Let's talk about that. Explain to the  
 6 panel how the ecologic- -- how the screening-level  
 7 assessment works.  
 8 A. What I do is I take the maximum  
 9 constituent concentration detected in soil,  
 10 compare that to a conservative screening value,  
 11 and if that exceeds, then I move it forward into  
 12 the baseline ecological risk assessment.  
 13 Q. And you mentioned ecological screening  
 14 values, or ESVs. Where do those come from?  
 15 A. I use ecological screening values from  
 16 EPA. They're called Eco-SSLs. They're called  
 17 soil screening values.  
 18 Q. And did you also calculate a  
 19 screening -- ecological screening value for barium  
 20 to use at this specific property?  
 21 A. Yes. Because there was not a soil  
 22 screening value for barium in the form of barium  
 23 sulfate. So I did a literature review and  
 24 calculated a screening value for barium.  
 25 Q. Walk the panel, if you would, through

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<p style="text-align: right;">Page 301</p> <p>1 that process that you followed to calculate your  2 ecological screening value for barium.  3 A. So I did a literature review to find  4 studies that included barium sulfate, soil,  5 invertebrates, and plants. So it's a very  6 specific review because it has to have all of  7 those features because we're talking about soil,  8 we're talking about barium sulfate and then we  9 have to have an effect or no effect to creatures.  10 And because that doesn't really exist for birds  11 and mammals, those kind of studies, I  12 identified -- I found seven studies that met all  13 of those criteria: Soil, barium sulfate,  14 invertebrates and plants.  15 And then, of those seven studies, I  16 identified that four of them analyzed barium in  17 the same analytical method that's used by DEQ,  18 which is essentially the 3050 extraction, 6010  19 analysis because barium can be analyzed in all  20 different types of ways. You know, through XRD  21 through true total barium. So I used the  22 analytical method that is used by DEQ for  23 developing standards, and I came up with four  24 studies that are -- that showed no observable  25 effects to invertebrates and to plants, and then I</p>	<p style="text-align: right;">Page 303</p> <p>1 assessment calculating that screening value for  2 sediment?  3 A. Yes.  4 Q. And did the DNR approve of your  5 screening value for sediment in the East White  6 Lake matter?  7 A. Yes.  8 Q. Now, in calculating your barium soil  9 ecological screening value, you mentioned that you  10 considered the form of barium that's available on  11 the property; correct?  12 A. Yes.  13 Q. Let's talk a little bit about barium. I  14 know it's come up several times in the hearing so  15 far. But why is it important to understand the  16 type of barium that's present when you're  17 performing your analysis, Dr. Connelly?  18 A. Okay. So barium sulfate is barite. It  19 is what is used in drilling mud. It's heavy. It  20 displaces fluids during oil field production. So  21 it is frequently associated with oil field sites.  22 Barite is recognized as nontoxic to ecological  23 species and to humans. It's recognized in that  24 way by EPA and the USGS. And what's important to  25 me is to demonstrate -- or to understand the form</p>
<p style="text-align: right;">Page 302</p> <p>1 calculated a geometric mean of the invertebrate,  2 no observed effects, and I came up with the  3 screening value of 2,424 milligrams per kilogram  4 dry weight.  5 Q. So to reiterate, Dr. Connelly, you used  6 no observed effects levels; correct?  7 A. Yes. That means there was no -- no  8 effect observed due to growth, reproduction, or  9 mortality.  10 Q. And you used those instead of lowest  11 observed effect levels, in effect, making this  12 calculation more conservative; correct?  13 A. Yes; right.  14 Q. And is this the first time that you've  15 calculated an ecological screening value?  16 A. No. I've done this before for sediment  17 in barium. And I did that for the East White Lake  18 site. The value is very similar. This is 2,424.  19 The barium screening value in sediment, based on  20 barium sulfate, is 2,197. So the fact that  21 they're similar gives me confidence that it's a  22 good number.  23 Q. And did you follow the same process in  24 calculating this barium screening value for soil  25 that you followed in your East White Lake risk</p>	<p style="text-align: right;">Page 304</p> <p>1 of barium at the property. Because barium sulfate  2 is of extremely limited toxicity, whereas a more  3 soluble form of barium could have some,  4 slightly -- it's still only slightly, but some  5 form of toxicity.  6 But in the conditions at the property  7 under the pH in the soil, all evidence, you  8 know -- and we did the XRD analysis -- is that  9 it's in the form of barium sulfate, which is very  10 nontoxic.  11 Q. So you mentioned the XRD analysis and  12 we're going to get to that in a second. But is it  13 fair to say that there are multiple lines of  14 evidence that support your finding that the barium  15 at this site is barium sulfate?  16 A. Yes.  17 Q. And talk a little bit about those. I  18 think you've already done that, but just sum up  19 for the panel the various lines of evidence that  20 you followed to determine that this was barium  21 sulfate.  22 A. So we have the XRD analysis, but also,  23 we have the field investigation where we did not  24 see evidence of toxicity. And also, too, within  25 the scientific literature, there are not evidences</p>

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1 in nature, in the environment of barium toxicity.  
 2 So I didn't expect to find a toxic form of barium  
 3 at the site because it's not something -- it's not  
 4 something that's an issue within the peer-reviewed  
 5 scientific literature. Barium sulfate is of very  
 6 low toxicity and that was borne out in the  
 7 abundance of the plants and wildlife on the  
 8 property.  
 9 Q. Now let's talk about the methods that  
 10 you used to determine that this was barium  
 11 sulfate. Walk the panel through the XRD and EDX  
 12 methods that they've heard a little bit about.  
 13 A. Okay. So if you look at the right-hand  
 14 side of the screen or your tablet, the XRD  
 15 analysis is X-ray diffraction and that involves  
 16 bombarding a sample of soil that has barium in it  
 17 with X-rays, and the X-rays that bounce off can be  
 18 read or interpreted to tell the crystalline  
 19 structure of the form of barium in that sample.  
 20 So it measures -- it shows the mineral structure.  
 21 So it shows: Is this barium sulfate or is it some  
 22 other compound of barium? So that's at the  
 23 mineralogical level.  
 24 On the other side of the screen is EDX,  
 25 which is electron microscopy, and that also uses

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1 energy in the form of electrons. So the soil  
 2 sample is bomb-barded with electrons. X-rays also  
 3 bounce off of the sample, and those X-rays can be  
 4 read and interpreted at the atomic level to  
 5 describe: Are you looking at barium? Are you  
 6 looking at sulfur? So it looks at the elements  
 7 that are present. So XRD is looking at the  
 8 molecule, barium sulfate. EDX is looking at the  
 9 individual elemental components: Barium, sulfur,  
 10 oxygen, carbon, et cetera.  
 11 Q. Do these methods, in your experience,  
 12 have identical detection limits or are there  
 13 differences in how these methods detect barium?  
 14 A. There are two entirely different methods  
 15 with two levels of precision. They're different  
 16 technologies. So, you know, one is looking at the  
 17 molecular structure. One is looking down there at  
 18 the micrometer level, at the atomic level. So  
 19 they're different analyses, different levels of  
 20 precision.  
 21 Q. So how do you use these analyses  
 22 together? How do you marry them up to determine  
 23 what form of barium is on the property?  
 24 A. So the lab runs the two of them together  
 25 to see if the methods are actually working, if

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1 they're in the correct ballpark. So they're sort  
 2 of a check and balance, just to see that the  
 3 method is good.  
 4 Q. Is it possible to mathematically compare  
 5 these two results to determine with specificity  
 6 that one missed something or the other didn't pick  
 7 something up?  
 8 A. Well, on some level, you can see: Am I  
 9 in the right ballpark? Am I in the right order of  
 10 magnitude? So the two numbers should be related.  
 11 They absolutely should be related. But they can't  
 12 be added or subtracted or divided. I mean,  
 13 they're two entirely different -- it would be like  
 14 running a regular barium analysis at one lab and  
 15 the other and then trying to subtract them from  
 16 each other or do something like that.  
 17 Q. And so can you say with confidence,  
 18 based on these results, what type of barium is  
 19 available in soils on the Henning Management  
 20 property?  
 21 A. Yes. I say with confidence it's barium  
 22 sulfate.  
 23 Q. And has the Louisiana Department of  
 24 Natural Resources approved the use of this kind of  
 25 testing at the -- has the Louisiana Department of

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1 Natural Resources approved of using barium  
 2 speciation data to perform a risk assessment or as  
 3 part of a risk assessment?  
 4 A. Yes.  
 5 Q. Now, you've already previewed this for  
 6 the panel, but I want them to see the actual  
 7 results from the lab. Walk them through what  
 8 these results showed about the barium at the  
 9 Henning Management property.  
 10 THE WITNESS: Judge, should I?  
 11 JUDGE PERRAULT: Yes, please.  
 12 A. So over here on the right, these are the  
 13 XRD results, which you can see it's called out  
 14 clearly. And then these are the EDX results over  
 15 here. So this lab report is a little bit  
 16 difficult to look at. This was run by Core  
 17 Mineralogy. And what we're calling out right here  
 18 is that all of these are forms of barium that the  
 19 lab looked for, and this is what they found is the  
 20 barium sulfate, 6 percent, 3.7 percent.  
 21 And then over here is the EDX result.  
 22 That's the electron microscopy. And this is just  
 23 barium, not barium sulfate, at 3.7 percent and  
 24 2.48 percent. And then, yeah, the question of how  
 25 are these used together, a barium sulfate molecule

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1 would be about 60 percent barium. That's because  
 2 barium's heavy. So if you say that -- you know,  
 3 what is 60 percent of 6? That's going to be about  
 4 3.6, so you're in the ballpark with EDX. And  
 5 then, if you look at barite at 3.7, that's about  
 6 4. Sixty percent of that is about 2.4. So you're  
 7 in the ballpark here. So this is basically just  
 8 matching up is this process running correctly.  
 9 So we identified that, at these  
 10 locations of maximum barium concentration, the  
 11 form of barium is barite.  
 12 BY MR. BRYANT:  
 13 Q. Before you sit down, Dr. Connelly, we've  
 14 heard mention of barium sulfide and we've heard  
 15 mention of barium chloride. And I see that  
 16 it's -- there are "ND"s under those. What does  
 17 that mean?  
 18 A. Those were nondetect. The lab was  
 19 looking for all forms of barium that could be  
 20 present, but only barium sulfate was detected.  
 21 Q. So did any other party run -- did anyone  
 22 else run barium speciation testing?  
 23 A. Not that I'm aware of.  
 24 Q. And so the only -- is it fair to say  
 25 that the only evidence of the type of barium

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1 that's available on this property shows that  
 2 barium chloride and barium sulfide were not  
 3 detected?  
 4 A. That's correct.  
 5 Q. Thank you, Dr. Connelly.  
 6 A. Okay.  
 7 Q. And let me ask one more question. I  
 8 realize this barium point is heavy on the science,  
 9 but one more question before we move off that.  
 10 Does the detection of barium chloride or barium in  
 11 groundwater change your conclusion that the barium  
 12 in surface soils is barium sulfate?  
 13 A. No.  
 14 Q. Why not?  
 15 A. Okay. So in the presence of excess  
 16 chlorides, excess salt, the presence of salt,  
 17 because it's strongly ionic, encourages the barium  
 18 sulfate to behave in a more ionic behavior and  
 19 become more disassociative into two separate ions.  
 20 So in the presence of elevated salt, barium can be  
 21 emancipated, and that's why sometimes you see it  
 22 in groundwater. Now, this is the highest  
 23 detection of barium in groundwater on the  
 24 property, and that's very low. That's below any  
 25 levels of toxicity. It's actually pretty close to

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1 the solubility of barium. If barium is  
 2 emancipated in the presence of chlorides, that's  
 3 going to happen in an anaerobic setting. And when  
 4 those barium ions move back, let's say they're  
 5 brought to the surface and there is oxygen, there  
 6 is an abundance of sulfates in the soil because of  
 7 decaying plants, decaying animals. And those  
 8 barium ions will very rapidly and suddenly bind  
 9 with sulfates within a matter of minutes because  
 10 that is a thermodynamically-favored reaction.  
 11 It's one of the most thermodynamically-favored  
 12 reactions of a metal with a sulfate, a carbonate  
 13 and oxygen.  
 14 So it is a very strong bond, and it will  
 15 form preferentially. So that's why we see barium  
 16 sulfate in the soil, even -- not -- even in the  
 17 absence of oil field operations. That is the form  
 18 of barium we expect to see because it is  
 19 thermodynamically-favored in the presence of  
 20 oxygen and sulfur.  
 21 Q. Let's walk through that process. I  
 22 don't want to belabor this, but let me break that  
 23 down a little bit. So if there are chlorides in  
 24 groundwater, which we see at this H-12 location,  
 25 that could be liberating barium from barium

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1 sulfate and causing these low detections of barium  
 2 in the groundwater; correct?  
 3 A. In an anaerobic setting, yes.  
 4 Q. If that barium, assuming that there is  
 5 barium in the groundwater in a form other than  
 6 barium sulfate, when it moves into an aerobic  
 7 environment, an oxygenated environment, that's  
 8 going to bind to the sulfates that are present and  
 9 reform barium sulfate?  
 10 A. Instantly and suddenly and very quickly,  
 11 yes.  
 12 Q. And can you tell the panel, if you know,  
 13 how do the sulfate levels on this property --  
 14 those were tested; correct?  
 15 A. The sulfate levels in Bayou Lacassine  
 16 are monitored by the Louisiana Department of  
 17 Environmental Quality, and the land is flooded by  
 18 Bayou Lacassine to flood the rice fields. And we  
 19 have every reason to think that the sulfates are  
 20 high on the property, but even in the absence of  
 21 that data, the abundance of the vegetation and  
 22 animals on the property, when they decay, they add  
 23 their sulfates back to the soil because plants and  
 24 animals are a little bit less than 1 percent  
 25 sulfur already. So they're adding their sulfates.

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1 So it's definitely a sulfate-rich environment.  
 2 Q. Thank you, Dr. Connelly. And so with  
 3 that in mind, even assuming that there is barium  
 4 in the groundwater in a form other than barium  
 5 sulfate, is that a risk to the flora or fauna of  
 6 the Henning Management property?  
 7 A. So one thing, the wildlife doesn't have  
 8 access to the groundwater. So that's one thing.  
 9 But the other thing is, where that is occurring,  
 10 there are no living organisms there because it's  
 11 not an oxygenated setting. So if those barium  
 12 ions were to make their way to an oxygenated  
 13 setting where there are living organisms, then it  
 14 would form barium sulfate yet again and  
 15 precipitate out, so not toxic.  
 16 Q. Let's move out of heavy science and back  
 17 into your screening assessment, Dr. Connelly. So  
 18 using the ecological screening values from the  
 19 literature and the ecological screening value for  
 20 barium that you calculated, what were the results  
 21 of your screening assessment on the Henning  
 22 Management property?  
 23 A. The screening assessment showed that in  
 24 the limited admission areas, barium is a  
 25 constituent that's exceeded the screening value

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1 and then, in a couple of locations, lead and  
 2 mercury slightly exceeded the screening value.  
 3 Strontium was above background in one location,  
 4 but it was not carried forward because there are  
 5 not ecological screening values for strontium.  
 6 Q. So you carried forward barium, lead and  
 7 mercury into your site-specific risk assessment?  
 8 A. Yes.  
 9 Q. Let me just ask you this: Does the  
 10 exceedance of a screening level, like we see here,  
 11 indicate risk?  
 12 A. No. It's just -- it's performed so that  
 13 you don't miss something and you need to do  
 14 further investigation. And if you remember, the  
 15 screening value is just the lowest number -- or  
 16 the highest number at which no observed effects  
 17 occur.  
 18 Q. And so you performed that additional  
 19 evaluation on barium, lead and mercury; correct?  
 20 A. Yes.  
 21 Q. Let's talk about that.  
 22 A. Okay.  
 23 Q. How does your site-specific ecological  
 24 risk assessment compare to the -- or differ from  
 25 the screening level assessment that you just

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1 discussed?  
 2 A. The site-specific risk assessment, which  
 3 is steps three through seven that are highlighted  
 4 there, involve selecting receptor species, birds  
 5 and mammals, to be used for calculations. It  
 6 involves research on the animals' diets, it  
 7 involves research on the toxicity of the  
 8 constituents and then risk is calculated at the  
 9 end of this process.  
 10 Q. And I have a couple of questions about  
 11 the process you follow, and I forgot to ask this  
 12 earlier: The data that you use in your risk  
 13 assessment, the soil data, what depths does that  
 14 come from?  
 15 A. I use soil data from zero to 4 feet.  
 16 Q. And why is that?  
 17 A. Because EPA requires that you  
 18 investigate the first 12 inches for biologically  
 19 active zones. The root zone on this property is  
 20 zero to 10 inches. RECAP calls for zero to  
 21 3 feet. So in an abundance of caution, we include  
 22 everything zero to 4 feet, even though it's really  
 23 the first few inches that are the biologically  
 24 active zone.  
 25 Q. So both as Mr. Ritchie testified and as

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1 you have determined based on your review of EPA  
 2 guidance, the biologically active zone is the  
 3 upper foot or so of the soils on the property?  
 4 A. That's right.  
 5 Q. Now, Dr. Connelly, how did you go about  
 6 choosing -- you mentioned that you use indicator  
 7 species. How do you go about choosing indicator  
 8 species?  
 9 A. I choose species that are -- by their  
 10 diets. So for birds, I pick out a herbivore, I  
 11 pick out a carnivore, I pick out one that has a  
 12 mixed diet, and then same thing for mammals.  
 13 Q. What indicator species did you choose  
 14 here?  
 15 A. Red-winged blackbird, common yellow  
 16 throat, red-tailed hawk, mourning dove, raccoon,  
 17 coyote.  
 18 Q. Swamp rabbit?  
 19 A. And the swamp rabbit.  
 20 Q. And let me ask you: The indicator  
 21 species, you chose seven species?  
 22 A. Yes.  
 23 Q. But do your conclusions apply to more  
 24 than just those seven species that you chose?  
 25 A. Yes. So for example, if I picked the

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1 red-winged blackbird that eats a 50 percent plant  
 2 diet, 50 percent invertebrate diet, that  
 3 represents the bird population that has that diet,  
 4 so I can make conclusions about other birds that  
 5 have a similar diet.  
 6 Q. So for instance, you performed your --  
 7 by performing that ecological risk assessment  
 8 using the red-winged blackbird, are you able to  
 9 draw conclusions, for instance, about other birds  
 10 like mallards that have a similar diet?  
 11 A. Yes. Mallards eat 50 percent vegetation  
 12 and 50 percent invertebrate, so it's a good  
 13 comparison.  
 14 Q. Once you've got your risk assessment set  
 15 up, how do you go about calculating risk?  
 16 A. This is an equation from EPA. It's  
 17 actually referenced up there: EPA 2003. And  
 18 basically it's a calculation of the animal's  
 19 exposure to a constituent in the numerator and  
 20 then a comparison to a safe dose of that  
 21 constituent in the denominator. And that ratio is  
 22 called the hazard quotient. If that ratio is less  
 23 than about 1 or 5, no risk is predicted and, if it  
 24 exceeds about 5, then further investigation needs  
 25 to be done.

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1 Q. And so does -- this equation, does it  
 2 account for site-specific considerations and the  
 3 behavior of the animals on this property in a way  
 4 that the screening level assessment doesn't?  
 5 A. Yes, it does. So for example, so we'll  
 6 just take the red-winged blackbird. This equation  
 7 will account for the size of the red-winged  
 8 blackbird's home range. It will account for the  
 9 ingestion rate of the red-winged blackbird. It  
 10 will account for the constituents in the  
 11 red-winged blackbird's diet. So -- and the same  
 12 thing will be true for each one, including the  
 13 coyote and the swamp rabbit.  
 14 MR. BRYANT: And can I approach, Your Honor?  
 15 JUDGE PERRAULT: Yes.  
 16 BY MR. BRYANT:  
 17 Q. I've handed you a copy of Exhibit 142.  
 18 And can you describe, please, Dr. Connelly, what  
 19 that is?  
 20 A. Yes. This is the documentation. It's  
 21 in Section 4-2. It's that equation that's up  
 22 there. So this is just the EPA guidance for  
 23 calculating that type of risk.  
 24 Q. I understand. So this equation that's  
 25 on the screen comes directly from the US EPA?

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1 A. Yes.  
 2 MR. BRYANT: We'd offer, file and introduce  
 3 Exhibit 142 into evidence.  
 4 MR. WIMBERLEY: No objection.  
 5 BY MR. BRYANT:  
 6 Q. Dr. Connelly, so moving -- using this  
 7 equation, how do you determine the factors that go  
 8 into the equation, the animals' behaviors or their  
 9 weights or things like that that you just  
 10 mentioned?  
 11 A. Some things, we can get directly from  
 12 EPA. Some, we get from commonly used sources like  
 13 the Department of Energy. Some, we have to  
 14 research and calculate on our own.  
 15 Q. And are all of the factors that you used  
 16 supported by either scientific literature, the  
 17 regulatory guidance or both?  
 18 A. Yes.  
 19 Q. What did the potential calculations that  
 20 you performed using that EPA equation tell you  
 21 about the health or the potential risk for -- to  
 22 wildlife on the Henning Management property?  
 23 A. Well, as I explained, it's a ratio.  
 24 It's a ratio of what the animal -- the dose to the  
 25 animal as compared to the safe dose. So if you

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1 think about it, if the animal is eating less than  
 2 the safe dose, that hazard quotient will be less  
 3 than 1. If the animal is consuming more than the  
 4 safe dose, the hazard quotient will be greater  
 5 than 1. And you'll see that all of these ratios  
 6 are significantly less than the benchmark of 1.  
 7 As a matter of fact, highlighted is the largest  
 8 number, which is .2, which is still significantly  
 9 less than the benchmark of 1. So this is a line  
 10 of evidence that the calculated risk to wildlife  
 11 on the property based on the EPA algorithm shows  
 12 that there's no predicted risk due to barium, lead  
 13 and mercury on the property.  
 14 Q. So just to reiterate, Dr. Connelly,  
 15 based on your calculations, you were able to form  
 16 conclusions about the potential for risk moving  
 17 forward --  
 18 A. Yes.  
 19 Q. -- on the Henning Management property?  
 20 A. Yes.  
 21 Q. What were those conclusions?  
 22 A. The conclusions are that there is no  
 23 evidence of risk now and there's no risk predicted  
 24 going forward.  
 25 Q. So do you -- do these findings coincide

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1 with your findings in your site evaluation?  
 2 A. Yes.  
 3 Q. Okay, Dr. Connelly. What is step eight  
 4 of the EPA process?  
 5 A. Step eight is to recommend whether or  
 6 not remediation is required for ecological  
 7 reasons.  
 8 Q. And what conclusion did you reach about  
 9 the need for remediation for ecological reasons?  
 10 A. Remediation is not required for this  
 11 property for ecological reasons.  
 12 Q. Now, Mr. Carmouche flashed up on the  
 13 screen during the opening a copy of Judge Cain's  
 14 order in this case. I know the panel's all aware  
 15 of that. You've seen that; correct?  
 16 A. Yes.  
 17 Q. Now, Dr. Connelly, if remediation is  
 18 needed for some other reason, either regulatory or  
 19 to comply with that order, that's not something  
 20 that you are speaking to here today?  
 21 A. Correct.  
 22 Q. You're speaking to whether remediation  
 23 is needed at the property to protect flora or  
 24 fauna; correct?  
 25 A. Correct.

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1 Q. And so -- and again, to reiterate, based  
 2 on your ecological evaluation, is remediation  
 3 needed to protect flora and fauna?  
 4 A. Definitely not.  
 5 Q. Is it fair to say, Dr. Connelly, that a  
 6 large-scale remediation of this Henning Management  
 7 property would actually cause ecological damage to  
 8 the property?  
 9 A. Yes.  
 10 Q. Tell the panel about that.  
 11 A. So a large-scale remediation that  
 12 involved excavation of soils or a large  
 13 groundwater action would be damaging to what is  
 14 currently existing habitat for a multitude of  
 15 birds that use the property within the Mississippi  
 16 Flyway and the Central Flyway. It would be  
 17 disrupting habitat for mammals such as the coyote.  
 18 It would be -- it would be destructive to those  
 19 animals and to their lives and there's not a  
 20 reason for it, not an ecological reason for it.  
 21 And I also think that large-scale remediation  
 22 would take away some of the services provided by  
 23 this property as far as recreation is concerned.  
 24 It would be very disruptive noise-wise, movement  
 25 of soils.

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1 And then also, too, I mean, the  
 2 croplands are flourishing. And they're not just  
 3 croplands. They're also providing diet for the  
 4 birds that you saw on the property. So I am not  
 5 supportive of remediation for ecological reasons.  
 6 As you mentioned, I understand remediation might  
 7 be required for other reasons. But for the  
 8 ecology, I think it would be not productive.  
 9 Q. And so just to sum up for the panel,  
 10 Dr. Connelly, we've walked through all of the  
 11 various lines of evidence that you considered; and  
 12 just to reiterate for the panel and have it all in  
 13 one place, tell the panel the conclusions that you  
 14 reached based on your ecological risk assessment  
 15 of the Henning Management property.  
 16 A. Okay. So just to summarize, the  
 17 property is a mosaic of habitats, including  
 18 grasslands, scrub-shrub forests, wetlands, as well  
 19 as croplands. The property is functioning as  
 20 expected for the region with all members of the  
 21 food chain intact and present, and that's true for  
 22 wildlife and for vegetation. Based on my  
 23 quantitative risk assessment calculated per EPA  
 24 guidance, I don't find calculated risk on the  
 25 property, and all lines of evidence are heavily

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1 weighted towards a functioning ecology that does  
 2 not require remediation.  
 3 MR. BRYANT: Thank you, Dr. Connelly.  
 4 And Your Honor, before I pass the  
 5 witness, I just want to confirm that Chevron  
 6 Exhibits 2, 112, and 142 will be admitted  
 7 into evidence.  
 8 JUDGE PERRAULT: 142, there was no objection.  
 9 Any objection to Exhibit 2 or 112?  
 10 MR. WIMBERLEY: No, Your Honor.  
 11 JUDGE PERRAULT: No objection. They all  
 12 three shall be admitted into evidence.  
 13 MR. BRYANT: Thank you, Your Honor.  
 14 JUDGE PERRAULT: Two, 112 and 142.  
 15 MR. BRYANT: Thank you, panel. And thank  
 16 you, Dr. Connelly.  
 17 CROSS-EXAMINATION  
 18 BY MR. WIMBERLEY:  
 19 Q. Good morning.  
 20 A. Good morning.  
 21 Q. My name's Todd Wimberley. I represent  
 22 the Hennings in this matter.  
 23 A. Okay.  
 24 Q. I don't think we've met before.  
 25 A. I don't think so.

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<p>1 Q. I want to start off asking you, you  2 talked about ESVs -- no, not ESVs. TRVs.  3 Toxicological reference value.  4 A. Yes.  5 Q. And you calculated one in this case;  6 right?  7 A. Yes.  8 Q. For barium sulfate?  9 A. Yes.  10 Q. What's the TRV for barium?  11 A. Could you be more specific?  12 Q. What's the TRV for barium for mammals?  13 A. Might be -- okay, so which form of  14 barium are you talking about?  15 Q. Barium as it's reported in the tables in  16 the EPA's ecotox values.  17 A. So the tables in EPA's -- the TRVs  18 reported in EPA's tables are based on the most  19 toxic form of barium, which does not exist at the  20 property. So those barium studies that were used  21 to create the TRVs in the EPA tables are the form  22 of like barium chloride, sometimes barium acetate,  23 sometimes barium hydroxide; but it's not  24 representative of the barium that's at the  25 property that is demonstrated to be barium</p>	<p>1 tell what source this is. It doesn't give me like  2 a title of the document.  3 Q. It gives a range of ESVs -- I'm sorry,  4 TRVs for barium in the range of 20 to 5; right?  5 Milligram per kilogram?  6 A. Okay. That's about arsenic. That's  7 about aluminum. This doesn't have barium on it.  8 Q. That one does.  9 A. All right.  10 (Reviews document.)  11 Okay. So there's a number here of  12 1,000 milligrams per kilogram on plants.  13 Q. Right.  14 A. I see 20.8 for birds. One-day-old  15 chicks. Okay, so I see that.  16 Q. And what else do you see right there?  17 A. Well, in yellow highlight, I just see  18 the birds right there.  19 Q. What's the next column?  20 A. Will you point to it?  21 Q. I thought it was rats.  22 A. Will you point?  23 Q. (Indicating) here.  24 A. I have a rat. I've got 20 -- okay. I  25 see a number right there, 5.1 milligrams per</p>
Page 326	Page 328
<p>1 sulfate.  2 Q. So when I go on to that table, what do I  3 see next to barium for TRV?  4 A. So are you talking about mammals right  5 now?  6 Q. Yes.  7 A. It might be a number close 40 or  8 50 milligrams per kilogram body weight.  9 Q. What about invertebrates?  10 A. I don't -- okay. So are you -- what  11 table are you looking at?  12 Q. I'm looking at something I found on the  13 EPA's website, a table of TRVs.  14 A. Right. So can you tell me what the  15 reference is, like the name of the -- I understand  16 it's a website. But can you tell me the name of  17 the document? Because, for example, for  18 invertebrates, there's a document called Eco-SSL,  19 for --  20 Q. This is called Ecological Toxicity  21 Reference Values.  22 A. Can you show it to me?  23 Q. Okay.  24 A. Okay. So I may recognize this, but  25 there's no really title on here. Like, I can't</p>	<p>1 kilogram per day, rat. I see that.  2 Q. Okay. Are those numbers out of line  3 with what you would expect?  4 A. Those numbers could be -- those numbers  5 could be used if -- so, for example, that 20 that  6 was associated with the one-day-old chicks, that's  7 from a study where the chickens were force-fed  8 barium acetate, I want to say, which is a form of  9 barium that can easily dissociate into ions, and  10 so that's where that number comes from. It's  11 actually miscalculated. It should actually be 30,  12 not 20, but it's not for the form of barium that's  13 at the property.  14 Q. So these are the numbers that EPA would  15 say you need to use when you don't know what kind  16 of barium that's at the property; right?  17 A. I even disagree with that.  18 Q. Why do you disagree with that?  19 A. Because I do know the form of barium  20 that's at the property.  21 Q. I'm not saying -- I'm saying when you  22 don't know. If you didn't have the XRD test, EPA  23 would tell you to use these numbers; right?  24 A. I also disagree with that.  25 Q. Okay. Why?</p>

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<p style="text-align: right;">Page 329</p> <p>1 A. Well, because barium forms barium 2 sulfate in soils of pHs of about -- anywhere from 3 about 1 all the way up to a pH of about 10. So 4 the expected form of barium is barium sulfate, not 5 barium chloride. So I disagree that EPA would 6 tell me to use that, when geochemically I'm not 7 expected to find that in a soil. 8 Q. Okay. If you didn't have any proof of 9 what kind of barium was at the property and you 10 handed EPA an ecotox study like you did, you would 11 be expected to use these numbers; right? 12 A. I also disagree with that. And here's 13 why: In ecological risk assessment today, 14 bioavailability in metals is really prevalent in 15 all of the larger risk assessments that are done, 16 so it is expected that the risk assessor will 17 investigate what form the metal is in because 18 metals have different behaviors depending on their 19 compounds that they're in. And that's not just 20 true only for barium; it's also true for chromium, 21 it's true for mercury. So to just handily say 22 barium has this toxicity, it's -- it's not very 23 scientifically correct. 24 Q. So in order to not use those numbers, 25 you need to be able to prove that you don't have</p>	<p style="text-align: right;">Page 331</p> <p>1 don't. 2 Q. What numbers would you use if you didn't 3 have any evidence about what the speciation of the 4 barium was? 5 A. So this is a difficult question to 6 answer and I'll tell you why. I've spent about 7 the last ten years studying barium. So I wouldn't 8 approach the property and not really understand 9 about barium. So it's a difficult question for me 10 to answer because there's not a scenario in which 11 I would go to the property and assume that it was 12 a soluble form of barium, because that's not what 13 I've seen and it's not what is present in the 14 scientific literature. There's not evidence that 15 that is the case in Louisiana or other parts of 16 the country. 17 Q. Do you have any -- would you agree that 18 these numbers here would represent an appropriate 19 TRV value for a toxic form of barium? 20 A. Okay. Yes. In the lab. Let's say 21 you're in the lab and you have managed to use 22 barium chloride, which is not even very stable, 23 but let's say you're in the lab and you have 24 barium chloride and you're running an experiment 25 in the lab under controlled conditions, yes.</p>
<p style="text-align: right;">Page 330</p> <p>1 the toxic forms of barium at the property; right? 2 A. Again, I also disagree with that as 3 well. 4 Q. Okay. How? 5 A. Well, because you said to not use these 6 numbers, I have to be able to prove out -- 7 Q. Uh-huh. 8 A. -- that it's barium sulfate. EPA is 9 made up of a panel of scientists, like DNR is. So 10 they're going to be reading the document for good 11 science; and if good science shows that that form 12 of barium won't be present in the soils, then I 13 wouldn't use that. 14 Q. That's what I mean, is you can prove it 15 whatever way you want. You have to have some 16 proof, though, that you're not dealing with a 17 toxic form of barium? 18 A. Yeah, I don't -- okay. Let me think -- 19 will you restate your question? 20 Q. These are the numbers, you'd agree with 21 me, that EPA would point to these numbers as being 22 the appropriate TRV values if you didn't have any 23 evidence that the barium at the property was not 24 the toxic form? 25 A. I just don't agree with that, no. I</p>	<p style="text-align: right;">Page 332</p> <p>1 Q. Okay. And I also heard you say that -- 2 I think I understood this from you -- regardless 3 of what form the barium may exist in the 4 groundwater or in the wet soil, when it gets to 5 the surface, it's going to turn into barium 6 sulfate; is that right? Is that what you said? 7 A. No. It's not going to turn into barium 8 sulfate. If there are free barium ions in a 9 setting that has no oxygen and let's say that 10 those barium ions are transported to the surface 11 in some kind of a way where now oxygen is present, 12 at the Henning property, the sulfates will be 13 sufficient to bind those barium ions in the 14 presence of oxygen and form barium sulfate. 15 Q. Will barium chloride oxidize at the 16 surface into barium sulfate? 17 A. Will barium -- barium chloride will 18 quickly disassociate in the presence of water and 19 oxygen, and the barium will bind sulfates and 20 precipitate out, yes. 21 Q. How long does that process take? 22 A. Minutes. 23 Q. What about barium carbonate? 24 A. Barium carbonate is also reasonably 25 soluble. So it would also -- it's not</p>

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1 preferential in a marsh setting or in Louisiana  
 2 settings. Barium sulfate is the  
 3 thermodynamically-favored form.  
 4 Q. So it's your testimony here today that  
 5 all the forms of barium that exist on the property  
 6 at depth, when they come to the surface, they're  
 7 going to become barium sulfate "quickly" and  
 8 "suddenly," I think was the word you used?  
 9 A. Yes, I said instantly and suddenly, yes.  
 10 Q. And again, just to compare the numbers  
 11 that you used as TRVs, I looked in your tables and  
 12 I saw that you used a figure of either 600 or  
 13 5,433 as your TRVs.  
 14 A. Yes.  
 15 Q. Compared to the toxic forms of barium at  
 16 5 and 20?  
 17 A. Correct.  
 18 Q. So a couple hundred times difference in  
 19 salinity --  
 20 A. That's correct. Right. And those are  
 21 based on studies of barium sulfate.  
 22 Q. And I also heard you say something  
 23 that -- that for the first time I heard.  
 24 I think you said that the hazard  
 25 quotient ratio is -- doesn't really warrant

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1 further action until you hit 5. Is that what you  
 2 said?  
 3 A. Yes.  
 4 Q. Because I've always heard it was 1.  
 5 A. Right. So under EPA protocol, it does  
 6 say 1 in the -- well, I'm not even sure it says 1.  
 7 But in practice, in current approved EPA risk  
 8 assessments around the country, hazard quotients  
 9 that are between 1 and sometimes as high as 16,  
 10 between 1 and 10 -- 5 is a pretty good benchmark.  
 11 If the hazard quotient is less than 5, EPA will  
 12 proceed and not require corrective action. And I  
 13 have seen higher than that, but that's -- and like  
 14 when I speak to someone on the phone at EPA, they  
 15 say that's sort of the benchmark, is between 1 and  
 16 5.  
 17 Q. So there are ramifications to being HQ  
 18 of 2?  
 19 A. So at this property, there are no HQs  
 20 that even approach 2.  
 21 Q. If the HQ did approach 2, what would it  
 22 tell you?  
 23 A. In my experience, the HQs that have  
 24 approached 2 generally are based on a single  
 25 maximum concentration rather than an average or a

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1 95 percent UCL. So it's not usually a reasonable  
 2 exposure for oil field constituents. I mean,  
 3 it -- if it approached 2 and it was something, you  
 4 know, potentially something more toxic -- we could  
 5 have a conversation about that -- but repeat your  
 6 question to make sure I'm answering the right  
 7 question.  
 8 Q. If you go to the EPA with a study that  
 9 says the HQ that you resulted is a 3, is the EPA  
 10 going to say: Okay, great. They don't need to do  
 11 anything?  
 12 A. They might, yes.  
 13 Q. They might?  
 14 A. Yes.  
 15 Q. They won't always?  
 16 A. No. I mean, definitely they would not  
 17 always, but I have seen probably five, six, seven  
 18 incidences recently within, you know, the last few  
 19 years where, in large ecological risk assessments,  
 20 EPA does approve hazard quotients that are, like I  
 21 said, up to like 16.  
 22 Q. Did you do -- did you ask the XRD to be  
 23 done?  
 24 A. Probably. I can't remember, but I'm  
 25 usually involved in that.

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1 Q. And at what depth did they take those  
 2 samples?  
 3 A. I want to say they're zero to 2 feet.  
 4 Q. And would you expect the top 2 feet to  
 5 be oxidized?  
 6 A. I mean, with the first few inches, you  
 7 usually have a decent amount of oxygen.  
 8 Q. How many inches?  
 9 A. I guess it would depend.  
 10 Q. How many inches do you think would be  
 11 oxidized at this site?  
 12 A. I can't really answer. It would have to  
 13 do with the compaction of the soil, the nature of  
 14 what the soil is. So I guess -- I can't quite  
 15 answer the question.  
 16 Q. So did you study the nature of the soil  
 17 at this site?  
 18 A. Others really studied the nature of the  
 19 soil, meaning the siltiness, the clayiness, that  
 20 type of thing.  
 21 Q. So you can't offer an opinion about what  
 22 depth that the soil at this site would be oxidized  
 23 enough to make the speciation change in barium?  
 24 A. Well, let's be clear. When there is  
 25 oxygen, that's one situation. When there is not

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1 oxygen, there are no living organisms there to  
 2 experience toxicity if there is a free barium ion  
 3 there. So if there is oxygen, then the barium  
 4 ions will seek to bind a sulfate.  
 5 Q. And how was this sample handled when  
 6 they took the samples? Did you study it? Were  
 7 you there?  
 8 A. For the XRD sample?  
 9 Q. Uh-huh.  
 10 A. No, I wasn't there.  
 11 Q. So you don't know, for instance, if they  
 12 took a core that was 2 feet deep, took it and put  
 13 it on a table and took some photos of it, bagged  
 14 it up and sent it to a lab?  
 15 A. I think you could ask that question to  
 16 Dave Angle or Mike Purdom because I wasn't present  
 17 when the sample was collected for XRD.  
 18 Q. Do you have any evidence that you can  
 19 share with us that oxygen wasn't introduced to  
 20 that sample enough so that the quick and sudden  
 21 speciation change could happen before it got to  
 22 the lab?  
 23 A. I feel certain that oxygen was  
 24 introduced to the sample. I feel certain.  
 25 Q. So it's very plausible that the barium

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1 could have existed in some other form and, once  
 2 they take the core sample out and put it on the  
 3 table and expose it to oxygen, this sudden change  
 4 occurs and, by the time it gets to the lab, it's  
 5 all barium sulfate?  
 6 A. Okay. So no. But I want to remind you  
 7 that let's say in your scenario that's the case.  
 8 Let's say you have an anaerobic sample. Right  
 9 now, in that anaerobic sample, there's no toxicity  
 10 to any living organism because there's no oxygen.  
 11 So if you expose it to oxygen, then you have now  
 12 put it into a setting where it can bind sulfate.  
 13 So the fact that it may or may not have a free  
 14 barium ion when there's no oxygen present, it's  
 15 not causing toxicity at that moment.  
 16 Q. So I think you didn't answer my  
 17 question. You can't tell us that the oxygen that  
 18 was introduced to that sample during the testing  
 19 in transportation wouldn't have caused it to all  
 20 be barite by the time it got to the lab; correct?  
 21 A. So I really want to answer your question  
 22 because I think you're introducing sort of a level  
 23 of confusion or uncertainty to this that's sort of  
 24 unnecessary.  
 25 Was oxygen introduced to the sample?

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1 Yes. Would the presence of oxygen affect the  
 2 sample? Yes. Is there any reason to think that  
 3 the entire sample was converted from barium  
 4 chloride to barium sulfate? No. There's no  
 5 reason to assume that. That's not reasonable.  
 6 It's not what we see on the site. If the entire  
 7 sample was barium chloride, again, it's in an  
 8 anaerobic setting, it's not bothering anything.  
 9 And if it's in an aerobic setting -- well, we  
 10 don't have any evidence of toxicity at the site.  
 11 We don't have any evidence of damage to plants or  
 12 animals, so there's no evidence that it's barium  
 13 chloride.  
 14 Q. So let me ask you this. What does  
 15 barium do to animals if they ingest the toxic  
 16 kind?  
 17 A. It has an effect -- so if an animal  
 18 ingests something that's easily disassociated to  
 19 barium ions, it can have an effect on the kidney.  
 20 Barium can replace calcium in some molecular  
 21 functions. So that's what happens.  
 22 Q. How long would it take -- let's pick --  
 23 what's one of your -- which one do you feel most  
 24 comfortable talking about? Which land animal of  
 25 the ones that you selected to analyze or you feel

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1 most comfortable talking about?  
 2 A. You pick one.  
 3 Q. Is it the swamp rabbit one?  
 4 A. That's fine.  
 5 Q. So how long would it take a swamp rabbit  
 6 to become sick from ingesting barium?  
 7 A. Okay. What form of barium is the rabbit  
 8 ingesting?  
 9 Q. A toxic kind.  
 10 A. A toxic kind. I think that if you fed  
 11 rabbits a toxic form of barium and like wrapped up  
 12 in a tortilla, they would die pretty quickly. If  
 13 you rolled it up, okay. So it could be used for  
 14 rat poison -- and this has happened. You know,  
 15 some humans accidentally thought that barium  
 16 chloride as rat poison should be used as their  
 17 flour and they made tortillas and they can die  
 18 quickly.  
 19 Q. I think the number they had for rats up  
 20 there was 5 milligrams per kilogram; right?  
 21 A. Five milligrams per kilogram of the  
 22 rat's body weight.  
 23 Q. If a rabbit's eaten that much toxic  
 24 barium, how long is it going to take to get sick?  
 25 A. I think probably quickly.

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1 Q. Okay. Quickly, you mean minutes?  
 2 A. Well, the studies I've read are about  
 3 humans that accidentally ingest barium chloride  
 4 and they're usually rushed to the hospital.  
 5 Q. Are there any toxic kinds of barium  
 6 where the sickness would occur over time?  
 7 A. Not that I'm aware of.  
 8 Q. So all the kinds of barium that are  
 9 toxic, it would just kill them right away?  
 10 A. I have not seen any scientific studies  
 11 that show chronic, long-term effects of barium  
 12 on -- on animals.  
 13 Q. Okay.  
 14 A. And I'm guessing you're talking about  
 15 long-term chronic low doses.  
 16 Q. Right.  
 17 A. Yeah. That didn't kill them suddenly.  
 18 No, I haven't seen that.  
 19 Barium can sequester in bones, but it  
 20 tends to make them stronger. Same thing, antlers;  
 21 same thing, teeth and shells.  
 22 Q. So in rabbits, though, it's rapid kidney  
 23 failure?  
 24 A. Well, in the scenario you described  
 25 where you're feeding the rabbits a toxic form of

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1 barium, enough to be acutely toxic --  
 2 Q. It doesn't have to be acutely toxic.  
 3 Are the rabbits on this property going to -- if  
 4 the form of -- let me put it this way.  
 5 If the form of barium on this property  
 6 was the toxic kind, okay, and the rabbits  
 7 encountered it at the levels that there are on the  
 8 property, would the rabbits all just die  
 9 immediately?  
 10 A. Let me answer that question with just  
 11 sort of a piece of information. There is no  
 12 evidence in the scientific literature of barium  
 13 toxicity to animals anywhere in this country and  
 14 not on the Henning property.  
 15 Q. Then why do we have TRVs for barium?  
 16 A. Because we have TRVs for all metals.  
 17 Q. Wasn't there some study that resulted in  
 18 the TRVs for barium, some rat study or a chick  
 19 study?  
 20 A. In the lab.  
 21 Q. And I just want to make sure we're  
 22 clear. The data that you used to come up with  
 23 your 95 UCL or your maxLIGHT concentrations, that  
 24 data is just plain old barium; right, not barium  
 25 sulfate?

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1 A. Correct.  
 2 Q. And you don't have any information from  
 3 the lab about what species that barium was?  
 4 A. Um.  
 5 Q. You may have some information about what  
 6 you think happens with the ground chemistry, but  
 7 from the lab, there's nothing on those lab reports  
 8 to tell you what kind of barium that is; correct?  
 9 A. The barium that's reported by the lab,  
 10 you're describing the 3050 extraction, 6010  
 11 analysis. That is a concentration of barium that  
 12 can be extracted from the sample using solvents  
 13 and potentially a little bit of -- so it  
 14 represents the barium that can be extracted from  
 15 the sample under certain conditions.  
 16 Q. Right.  
 17 A. So, and then what -- the resulting  
 18 barium number is -- is barium, it's not barium  
 19 sulfate.  
 20 Q. Okay. And those are the numbers that  
 21 you used to determine what the area concentrations  
 22 were; right?  
 23 A. Yes.  
 24 Q. So you're using barium data, plain ol'  
 25 barium because we don't know what kind it is, and

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1 comparing that to a barium sulfate TRV that you  
 2 calculated; correct?  
 3 A. No, not exactly. I used the barium data  
 4 to describe AOIs --  
 5 Q. Right.  
 6 A. -- based on studies of barium sulfate  
 7 that were analyzed using the 3050 extraction 6010  
 8 analytical method. So it is apples to apples.  
 9 Q. But your TRV takes into account the  
 10 insolubility of barium sulfate. You're looking at  
 11 how toxic is the barium sulfate; you're not  
 12 looking at how toxic is some unknown kind of  
 13 barium; right?  
 14 A. That's correct.  
 15 Q. So you're using barium data and  
 16 comparing it to a barium sulfate TRV?  
 17 A. Yes.  
 18 Q. Is there something in the literature  
 19 that you can point to to tell me that it's okay to  
 20 do that?  
 21 A. Let's see. Is there something in the  
 22 literature?  
 23 Q. Like the EPA guidelines.  
 24 A. Well, the TRV is based on a certain form  
 25 of a metal. And -- let me see if I understand

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1 your question. Will you say it again?  
 2 Q. What I'm saying is you're using some  
 3 data from the lab that doesn't really tell you  
 4 what kind of barium it is. And you're using that  
 5 in your formula, the EPA-prescribed formula, to  
 6 compare that to a TRV that you calculated for  
 7 barium sulfate.  
 8 A. Right.  
 9 Q. I'm asking you is there something in the  
 10 EPA guidance that says it's okay to use one kind  
 11 of data set and a TRV from another data set?  
 12 A. I do understand your question. I think  
 13 this will make it clear. I calculated those TRVs  
 14 for the East White Lake project. The East White  
 15 Lake project was carefully reviewed by DEQ and DNR  
 16 and approved. So this is an approved method in  
 17 our state. So whether or not EPA has exactly  
 18 approved this, I don't know. But this is the only  
 19 state in the country where these kind of  
 20 conversations happen. So the barium research is  
 21 actually happening right here.  
 22 Q. I'm not asking you -- I'm not  
 23 complaining about the way you calculated your TRV.  
 24 I think that -- as far as I know, if you're trying  
 25 to analyze what barium sulfate can do to you,

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1 those TRVs are appropriate in my mind.  
 2 What I'm asking you: Is there anything  
 3 in the EPA guidance that says you can take barium  
 4 unknown speciation data and compare it to one  
 5 specific species of barium and say "this is  
 6 appropriate"?  
 7 A. If I've -- no, I can't answer your  
 8 question exactly because I don't know the answer  
 9 to it. But I can tell you that if I've identified  
 10 that the form of barium on the property is barium  
 11 sulfate, it is appropriate to take those barium  
 12 concentrations that we measured and say this is  
 13 barium sulfate and use a barium sulfate TRV. I  
 14 think all of that makes perfect sense and has been  
 15 approved by DNR and DEQ.  
 16 Q. Would you agree with me that if we used  
 17 a TRV of 20, that your hazard quotient would be  
 18 above 1?  
 19 A. Absolutely. We would be using the wrong  
 20 TRV. Yes. You could make the hazard quotient get  
 21 higher by using the wrong TRV.  
 22 Q. So the plain ol' barium TRV that's  
 23 published in the data would make the hazard  
 24 quotient somewhere 2 -- 1 1/2, 2?  
 25 A. The barium TRV for a soluble form of

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1 barium potentially would cause the hazard quotient  
 2 to be higher than 1, maybe. I haven't done it  
 3 yet. But it's inappropriate because it's not the  
 4 form of barium that's at the property.  
 5 Q. And like you said, you didn't do that  
 6 analysis?  
 7 A. I didn't do what?  
 8 Q. You didn't use the barium TRV from EPA  
 9 and then do that analysis so you could tell us  
 10 today that --  
 11 A. No. I didn't do that.  
 12 Q. -- you didn't think it was appropriate?  
 13 I'm sorry. Go ahead.  
 14 A. Okay. No. I didn't do it because the  
 15 form of barium on the property is barium sulfate.  
 16 So no, I did not do that calculation, but I don't  
 17 think it's valuable.  
 18 Q. How many XRD tests do we have?  
 19 A. Two.  
 20 Q. And where are they?  
 21 A. Locations H-8 and I want to say H-28 or  
 22 H-24.  
 23 Q. In the top 2 feet of the soil; right?  
 24 A. Yes.  
 25 Q. And that, in your mind, is enough to

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1 characterize the whole 1200 acres?  
 2 A. Okay. And I'll tell you why. This is  
 3 not the first time we've done this analysis. I  
 4 personally have been involved in probably seven  
 5 different oil field sites where we ran XRD and  
 6 EDX, and the results consistently are barium  
 7 sulfate. So I wasn't surprised by this. That's  
 8 what we see throughout South Louisiana, and it's  
 9 what I expect.  
 10 Q. Another thing you said was that the  
 11 groundwater, you didn't really analyze the  
 12 groundwater; right, because it didn't matter to  
 13 you?  
 14 A. I am not a groundwater specialist, so  
 15 no, I did not analyze that, but the wildlife don't  
 16 have access to the groundwater, so it's not a  
 17 complete pathway for ecological reasons.  
 18 Q. Are you aware that Mr. Henning has plans  
 19 to put a fish pond out there?  
 20 A. Yes.  
 21 Q. Do you know how deep his fish pond is?  
 22 MS. RENFROE: Excuse me, Your Honor. At this  
 23 point, I want to object only to make the  
 24 point that the question is going into a  
 25 subject that Dr. Connelly is prepared to

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1 address today but also prepared to address in  
 2 rebuttal. I'm perfectly willing to let her  
 3 answer the question so long as we don't waive  
 4 our right to have her testify about that in  
 5 rebuttal.  
 6 JUDGE PERRAULT: All right. Does Henning  
 7 have a problem with that?  
 8 MR. WIMBERLEY: I don't think so, Your Honor.  
 9 MS. RENFROE: Thank you.  
 10 JUDGE PERRAULT: Please proceed.  
 11 A. Okay. I want to change my answer. You  
 12 said, Are you aware that Mr. Henning wants to put  
 13 in -- you said a fish pond?  
 14 BY MR. WIMBERLEY:  
 15 Q. Or that he might.  
 16 A. Okay. Well, that was not in his  
 17 deposition for what he said he wanted to do with  
 18 the property, but I can talk about a fish pond if  
 19 you want to.  
 20 Q. Okay. What I want to know is how deep  
 21 do you think the groundwater is there?  
 22 A. I --  
 23 Q. The shallow groundwater.  
 24 A. I am relying on the advice of David  
 25 Angle and Mike Purdom about the depth of the

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1 groundwater. And to my understanding, the  
 2 groundwater does not intersect, for example, the  
 3 blowout pond that's there now that's 15 feet deep.  
 4 Q. Do you know if the groundwater would  
 5 intersect a pond that was 25 feet deep?  
 6 A. I'm not really a groundwater specialist.  
 7 I don't know that a fish pond is going to be  
 8 25 feet deep. So it's -- let's put it this way:  
 9 For a recreational pond in Louisiana, I don't  
 10 think 25 feet deep is really typical.  
 11 Q. Okay.  
 12 A. But I don't know.  
 13 Q. Are you an expert in fish ponds?  
 14 A. I mean, I've cultivated fish, but I'm  
 15 not an expert in fish ponds.  
 16 Q. I'm just asking. I fish a lot. It's  
 17 common. It's not every one, but it's common to  
 18 have 25- 30-foot holes in ponds.  
 19 A. I was really relying on some guidance  
 20 from LSU Ag, I think it is. It's either LSU Ag or  
 21 Louisiana Wildlife and Fisheries. But  
 22 recreational ponds for, for example, bass, the  
 23 bass need to thrive in about 4 feet of water. So  
 24 I wouldn't know about the 25 feet.  
 25 Q. Okay. But my only point that I wanted

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1 to raise with you was you haven't analyzed how  
 2 toxic the groundwater might be to animals that may  
 3 encounter it; that's correct?  
 4 A. So I haven't looked at the groundwater  
 5 and analyzed that. But I have looked at the water  
 6 in the blowout pond itself and looked at the  
 7 quality of that water, and that is safe for  
 8 aquatic species.  
 9 Q. And you're saying that that's not  
 10 connected to the groundwater?  
 11 A. I don't think it is.  
 12 Q. But you haven't analyzed and done the  
 13 work that would be necessary to have an opinion  
 14 about whether the shallow groundwater, if it did  
 15 encounter animals, whether it would have a toxic  
 16 effect on them? You haven't done that work today?  
 17 A. I haven't done that work. I could, but  
 18 I haven't.  
 19 Q. Okay.  
 20 MR. WIMBERLEY: I think that's all I have,  
 21 Your Honor. Thank you.  
 22 JUDGE PERRAULT: Any redirect?  
 23 MS. RENFROE: Yes, Your Honor.  
 24 JUDGE PERRAULT: Please proceed.  
 25 REDIRECT EXAMINATION

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1 BY MS. RENFROE:  
 2 Q. Your Honor, members of the panel,  
 3 Dr. Connelly, good morning. It's still morning.  
 4 Let me pick up with that very last point  
 5 that Counsel was asking you about.  
 6 He was asking you whether you had done  
 7 the work to analyze whether the groundwater, the  
 8 shallow groundwater, would have any effect on, I  
 9 think he said, animal species at the site. And  
 10 what is your opinion, Dr. Connelly, based on your  
 11 expertise and your specific investigation of the  
 12 conditions at this site, as to whether animals  
 13 would have any exposure to ground -- to the  
 14 shallow groundwater?  
 15 A. Right. So the animals don't have  
 16 exposure to the shallow groundwater. Per what I  
 17 understand about groundwater, they don't have  
 18 access to it, so it's considered an incomplete  
 19 pathway.  
 20 Q. And is that why you didn't evaluate the  
 21 groundwater?  
 22 A. Yes.  
 23 Q. All right. Now, you were telling us a  
 24 few minutes ago about -- in response to questions  
 25 about your barium analysis, that DEQ and DNR have

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1 both accepted your barium speciation methodology?  
 2 A. Yes.  
 3 Q. That you had presented to them in prior  
 4 cases?  
 5 A. Yes.  
 6 Q. Can you tell us the names of some of  
 7 those prior cases --  
 8 MR. WIMBERLEY: Objection, Your Honor. I  
 9 didn't get into that on cross.  
 10 MS. RENFROE: I believe he did, Your Honor,  
 11 and I believe he asked all kinds of questions  
 12 about barium speciation. And she responded  
 13 by saying DNR had and DEQ had accepted barium  
 14 speciation methodology. And I'm simply  
 15 following up to ask what are the names of  
 16 those cases.  
 17 JUDGE PERRAULT: I'm going to allow it  
 18 because I heard barium speciation.  
 19 MS. RENFROE: Thank you.  
 20 A. We did barium speciation at the East  
 21 White Lake site, we did it at LA Wetlands site, we  
 22 did it, I believe, at Hero Lands. Those are a few  
 23 that I can think of right now.  
 24 BY MS. RENFROE:  
 25 Q. In which the barium speciation

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1 methodology and results were presented by you to  
 2 either DEQ, DNR or both?  
 3 A. Correct.  
 4 Q. And it's your testimony that in those  
 5 cases, one or both agencies accepted the barium  
 6 speciation methodology that you presented?  
 7 A. Yes. As a matter of fact, they asked  
 8 for it.  
 9 Q. And is that the -- is the method that  
 10 you used in those cases the same approach, same  
 11 methodology you used to speciate the barium in  
 12 this case?  
 13 A. Yes.  
 14 Q. Now, you were asked some questions about  
 15 what barium does to animals if ingested. Did you  
 16 see, based on your site investigation at the  
 17 Henning Management property, did you see any  
 18 evidence, any whatsoever, of toxicity to either  
 19 plants or animals from barium at the site?  
 20 A. No.  
 21 Q. So then no evidence that would suggest  
 22 that the barium at the site is causing any adverse  
 23 ecological effect?  
 24 A. Correct.  
 25 Q. And has anyone presented to you, anyone

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1 from the Henning Management part of the case,  
 2 presented to you any evidence to suggest that the  
 3 barium at the site is causing any adverse  
 4 ecological effect?  
 5 A. No.  
 6 Q. And while we're on that topic,  
 7 Dr. Connelly, did anybody that you know of  
 8 associated with Henning Management in this case,  
 9 did anybody perform an ecological risk assessment  
 10 of the conditions at the Henning Management site  
 11 like you did?  
 12 A. I don't think so.  
 13 Q. So you're the only one in this case  
 14 who's done an ecological evaluation of the  
 15 conditions at the Henning Management property?  
 16 A. I think Walker Wilson did a plant survey  
 17 and he also, you know, he walked the property but  
 18 he did not do an ecological risk assessment.  
 19 Q. Now, with respect to the various lines  
 20 of evidence that you told the panel about, you  
 21 included -- you told us about your vegetation  
 22 survey, your wildlife survey, your habitat  
 23 evaluation and your quantitative risk assessment,  
 24 all of which you did at the Henning Management  
 25 property and you've described this morning.

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1 Have you done each of those steps and  
 2 presented the results of your work to DNR in other  
 3 cases, in other most feasible plan cases?  
 4 A. Yes.  
 5 Q. And has the DNR accepted your  
 6 methodology for performing a vegetation survey?  
 7 A. Yes.  
 8 Q. Have they accepted your methodology for  
 9 doing a wildlife survey?  
 10 A. Yes.  
 11 Q. And what about your methodology for  
 12 doing a habitat evaluation?  
 13 A. Yes.  
 14 Q. And then the method that you used for  
 15 doing a quantitative risk assessment, has DNR  
 16 accepted that approach in prior cases?  
 17 A. Yes.  
 18 Q. Most feasible plan cases?  
 19 A. Yes.  
 20 Q. Now, you were also asked some questions  
 21 about the hazard quotients. And I know the panel,  
 22 I'm sure, will be very interested to go back and  
 23 look at your slide 32, which summarizes all of  
 24 your calculated hazard quotients that you  
 25 calculated as part of your quantitative risk

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Page 357	<p>1 assessment. And Counsel asked you about hazard</p> <p>2 quotients of 2 and 3 and so on. Do you recall</p> <p>3 those questions?</p> <p>4 A. Yes.</p> <p>5 Q. Now, based on calculations, were there</p> <p>6 any hazard quotients that even approached 1?</p> <p>7 A. No.</p> <p>8 Q. In fact, I think you highlighted in</p> <p>9 green the highest one and it was 0.232; correct?</p> <p>10 A. Yes; correct.</p> <p>11 Q. So fair to say that there were no hazard</p> <p>12 quotients of 2 or 3?</p> <p>13 A. Correct.</p> <p>14 Q. And you weren't presented with any</p> <p>15 calculations by anybody else to suggest that there</p> <p>16 were hazard quotients of 2 or 3 or higher?</p> <p>17 A. Right. That's correct, I wasn't.</p> <p>18 Q. And so, to wrap up, then, were you</p> <p>19 presented with any evidence during your</p> <p>20 examination by counsel for Henning Management that</p> <p>21 suggests to you that there was any adverse effect</p> <p>22 to the vegetation at the Henning Management</p> <p>23 property from oil field constituents?</p> <p>24 A. No.</p> <p>25 Q. Were you presented with any evidence</p>	Page 359	<p>1 Perrault, administrative law judge. We've</p> <p>2 come back on the record for Docket</p> <p>3 No. 2022-6003. And does the panel have any</p> <p>4 questions for Dr. Connelly?</p> <p>5 PANELIST OLIVIER: Yes, we do.</p> <p>6 JUDGE PERRAULT: Please proceed. State your</p> <p>7 name for the record.</p> <p>8 PANELIST OLIVIER: Stephen Olivier.</p> <p>9 Hey, Ms. Connelly, how are you doing?</p> <p>10 THE WITNESS: Good.</p> <p>11 PANELIST OLIVIER: So it was brought up about</p> <p>12 installing potentially a pond on maybe some</p> <p>13 of the AOIs on the property. And so my</p> <p>14 question is if you were aware or if you knew</p> <p>15 that a pond was planned to be installed on</p> <p>16 any of the AOIs, would you have included a</p> <p>17 potential shallow groundwater contact within</p> <p>18 your ecological assessment?</p> <p>19 THE WITNESS: I think I wouldn't have because</p> <p>20 my best evidence is that the ponds would not</p> <p>21 be deeper -- deep enough to encounter the</p> <p>22 shallow groundwater. So for example, the</p> <p>23 blowout pond is 15 feet deep, Bayou Lacassine</p> <p>24 is 10 feet deep, the shallow ditches on the</p> <p>25 property are just a few feet deep; and then</p>
Page 358	<p>1 from counsel for Henning Management to suggest</p> <p>2 that there was any adverse effects to wildlife at</p> <p>3 the Henning Management property from oil field</p> <p>4 constituents?</p> <p>5 A. No.</p> <p>6 Q. So is -- is it then -- does your opinion</p> <p>7 remain, Dr. Connelly, that there's no ecological</p> <p>8 reason to perform any remediation at the Henning</p> <p>9 Management property?</p> <p>10 A. That's my strong opinion.</p> <p>11 MS. RENFROE: Thank you. Those are all the</p> <p>12 questions I have.</p> <p>13 JUDGE PERRAULT: Does the panel have any</p> <p>14 questions?</p> <p>15 PANELIST OLIVIER: Could we take a 15-minute</p> <p>16 break to discuss?</p> <p>17 JUDGE PERRAULT: Any objection to that?</p> <p>18 MS. RENFROE: That's fine.</p> <p>19 MR. BRYANT: Fine.</p> <p>20 JUDGE PERRAULT: We'll take a 15-minute</p> <p>21 break. We'll be back at, I guess, 11:25.</p> <p>22 (Recess taken at 11:11 a.m. Back on</p> <p>23 record at 11:37 a.m..)</p> <p>24 JUDGE PERRAULT: We're back on the record.</p> <p>25 It's now February 7th at 11:37. I'm Charles</p>	Page 360	<p>1 the guidance I have for recreational ponds</p> <p>2 doesn't put them as deep as encountering</p> <p>3 shallow groundwater, so I don't think I would</p> <p>4 have included that.</p> <p>5 PANELIST OLIVIER: And just because it was</p> <p>6 brought up earlier, they mentioned a depth as</p> <p>7 deep as 25 feet. So if you were to evaluate</p> <p>8 based on 25 feet, would that change your</p> <p>9 decision?</p> <p>10 THE WITNESS: So my problem with that is I</p> <p>11 haven't really investigated groundwater. I</p> <p>12 haven't looked at the concentrations. I</p> <p>13 don't know if 25 feet would encounter the</p> <p>14 shallow groundwater. You may want to save</p> <p>15 that question for Dave Angle because he will</p> <p>16 be able to answer that and Angela Levert can</p> <p>17 probably answer it too. It's just, I would</p> <p>18 have to know: Does the 25 feet encounter the</p> <p>19 shallow groundwater? I think it doesn't. I</p> <p>20 don't know. And that would inform my</p> <p>21 opinion.</p> <p>22 PANELIST OLIVIER: Thank you.</p> <p>23 THE WITNESS: Okay.</p> <p>24 PANELIST OLIVIER: That's all we have for</p> <p>25 you.</p>

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1 JUDGE PERRAULT: That's all the questions?  
2 PANELIST OLIVIER: Yes.  
3 JUDGE PERRAULT: You may call your next  
4 witness.  
5 MS. RENFROE: Thank you, Your Honor.  
6 At this time, we will call Angela  
7 Levert.  
8 JUDGE PERRAULT: How are you doing? Please  
9 state your name for the record.  
10 THE WITNESS: I'm Angela Levert.  
11 JUDGE PERRAULT: And please spell your last  
12 name.  
13 THE WITNESS: It's L-E-V-E-R-T.  
14 ANGELA LEVERT,  
15 having been first duly sworn, was examined and  
16 testified as follows:  
17 DIRECT EXAMINATION  
18 MS. RENFROE: Your Honor, as a housekeeping  
19 matter, we do have copies of Ms. Levert's  
20 PowerPoint presentation, which I'd like to  
21 hand out.  
22 JUDGE PERRAULT: Please do so.  
23 MS. RENFROE: Just for efficiency, I would  
24 also like to hand to you and the panel  
25 members a copy of her RECAP evaluation, which

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1 is already in evidence as a portion of  
2 Exhibit 1. So let me, if I may, hand those  
3 out.  
4 JUDGE PERRAULT: Yes, please.  
5 MS. RENFROE: May I proceed, Your Honor?  
6 JUDGE PERRAULT: Yes, please.  
7 MS. RENFROE: Thank you.  
8 BY MS. RENFROE:  
9 Q. Good morning. A little bit left of the  
10 morning, Ms. Levert.  
11 A. Good morning.  
12 Q. Thank you for joining us this morning.  
13 Can you state your full name for the record,  
14 please?  
15 A. It's Angela Levert.  
16 Q. Ms. Levert, this is not your first time  
17 to appear in front of a panel of the DNR, is it?  
18 A. That's correct. I have done this before  
19 with a number of you guys.  
20 Q. All right. Now I'm going to ask you to  
21 move that microphone a little closer to you.  
22 A. Yeah, tell me if this helps.  
23 Q. We'll see.  
24 A. Okay.  
25 Q. And I'm going to need you to keep your

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1 voice up. Okay?  
2 A. Okay.  
3 Q. It's a large room and I want to make  
4 sure everybody can hear you.  
5 A. Okay. Thank you.  
6 Q. Tell us who you are employed by.  
7 A. I work for ERM, Environmental Resources  
8 Management, with my colleague, Helen, and Mike  
9 Purdom is another colleague of mine, who you heard  
10 from.  
11 Q. And Dave Angle, I think.  
12 A. And Dave Angle as well.  
13 Q. Another colleague that the panel will  
14 get a chance to meet this afternoon, I expect.  
15 Now, even though you may be well-known  
16 to members of the DNR panel and the DNR, I think  
17 it's important for this record and for every one  
18 of these panel members to really know about you  
19 and your expertise and your background.  
20 So can you take a minute and tell the  
21 panel about both your education and your area of  
22 expertise?  
23 A. Sure. My educational background is in  
24 environmental chemistry. In my master's work in  
25 environmental chemistry, I actually completed in

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1 the school of public health at UNC. And that  
2 provided a really good foundation for the kind of  
3 work that I'm doing now, which is risk assessment  
4 and focus on public health protection. And I've  
5 been doing that kind of work for a long time now,  
6 just over 30 years. And the majority of that,  
7 over the last 25 years, was with a focus  
8 specifically on implementing RECAP in Louisiana.  
9 And I've had the good fortune to be able to work  
10 with the DEQ and members at the DNR regularly on  
11 these projects to present to them, work with them  
12 not just in litigation but that is my  
13 regulatory -- my routine regulatory practice is  
14 working directly with DNR and DEQ on RECAP  
15 investigations, RECAP evaluations and hopefully  
16 closing out sites to completion with the RECAP  
17 program.  
18 Q. You've done hundreds of risk  
19 assessments, human health risk assessments?  
20 A. Yes. Yes, I have.  
21 Q. And of those hundreds, most or many were  
22 done under Louisiana's RECAP?  
23 A. That's right, because the program's been  
24 in place now since '98, right, so 25 years. The  
25 most recent promulgation was 2023, but RECAP has

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<p style="text-align: right;">Page 365</p> <p>1 been around for that long and obviously, then, has  2 a long history of implementation learnings and  3 improvement and development over time, yes.  4 Q. And of your experience in doing human  5 health risk assessments, and particularly RECAP  6 evaluations, tell us about your work with oil  7 field sites in Louisiana in particular, if you  8 would.  9 A. Sure. A lot of my sites do end up being  10 oil field-related in some way, shape, or form,  11 whether it's an industry that is in support of E&amp;P  12 or cases like this one or projects like this one  13 that are E&amp;P sites. And, of course, there are  14 many of these kinds of sites that aren't in a  15 regulatory program with the DNR. That's a regular  16 part of my practice. And what that means for me  17 is we are routinely looking at a small number of  18 constituents that we've been focusing on for many,  19 many years now.  20 Q. And have you actually appeared before  21 the DNR in most feasible plan hearings like the  22 one we're in today?  23 A. I have. This is actually my -- let's  24 see. This is No. 8 for me.  25 Q. And can you name the other cases in</p>	<p style="text-align: right;">Page 367</p> <p>1 BY MS. RENFROE:  2 Q. Is this a copy of your risumi or  3 curriculum vitae?  4 A. It is.  5 Q. And can you tell the -- tell us if it is  6 an accurate compilation of your education and  7 professional experience.  8 A. It is, yes.  9 MS. RENFROE: Your Honor, at this time, I  10 offer Chevron Exhibit 145 into evidence.  11 JUDGE PERRAULT: No objection. It shall be  12 admitted.  13 MS. RENFROE: Thank you. At this time, Your  14 Honor, I would also now tender Ms. Levert as  15 an expert in the areas of environmental data  16 evaluation, environmental chemistry,  17 environmental human health assessment and  18 RECAP.  19 JUDGE PERRAULT: Do you have any questions?  20 MR. CARMOUCHE: Yeah.  21 VOIR DIRE EXAMINATION  22 BY MR. CARMOUCHE:  23 Q. Good midday.  24 A. Midday, yeah. Hello, Mr. Carmouche.  25 Q. Good afternoon. I took your deposition</p>
<p style="text-align: right;">Page 366</p> <p>1 which you offered testimony of -- on RECAP, your  2 RECAP evaluations in other most feasible plan  3 hearings?  4 A. Sure. Sure. And I have listed them  5 here, but I'll use the project names as I know  6 them. The most recent one being the Newman  7 project, Savoie, Poppadoc. East White Lake is  8 another. The Hero Lands property -- that one was  9 in Belle Chasse -- Louisiana Wetlands, and  10 Franklin, the Jeanerette Lumber site. Those are  11 the ones that I have been involved with.  12 Q. In those cases, have you been accepted  13 by the respective DNR panels as an expert in the  14 area of environmental data evaluation,  15 environmental chemistry, human health risk  16 assessment and RECAP?  17 A. Yes, I have.  18 Q. And have courts also accepted you as an  19 expert in one or more of those areas?  20 A. Yes. And in the same areas of study,  21 that's correct.  22 Q. Ms. Levert, let me hand you a copy of  23 what's been marked as Chevron Exhibit 145.  24 MS. RENFROE: And if I may, Your Honor, hand  25 this to the Court and the panel members.</p>	<p style="text-align: right;">Page 368</p> <p>1 before.  2 The 2003 version, were you involved in  3 the development of that version?  4 A. Not in the development, but I have  5 followed the revisions of RECAP through the years  6 of promulgation, '98, 2000, 2003. And each time  7 that there has been an issue of a draft or a  8 potential revision to RECAP, I have participated  9 in the review of that document --  10 Q. Right.  11 A. -- and provided comments or -- I have  12 provided comments, I think, each time, as a matter  13 of fact.  14 Q. And that's what I'm trying to get to.  15 You're involved in the process in commenting,  16 either for ERM or for oil companies, as to drafts  17 and other versions of RECAP that have happened in  18 the past; is that fair?  19 A. Right. As a practitioner in RECAP, that  20 is true, providing info- -- well, evaluation,  21 questions. That's part of my regular practice.  22 So yes, when the drafts have come out, I've issued  23 questions or comments to the agency about that,  24 yes.  25 Q. Do you recall ever objecting and</p>

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1 disagreeing with anything that was written in the  
2 2003 version?  
3 MS. RENFROE: Your Honor, let me object to  
4 this question. What -- this is really going  
5 to establishing bias of the witness. He can  
6 do that if he wants to on his  
7 cross-examination. It's not a question that  
8 goes to her qualifications.  
9 MR. CARMOUCHE: It goes to her credibility as  
10 to her knowledge about RECAP, which she's  
11 introducing her as an expert.  
12 MS. RENFROE: Again, it's appropriate for  
13 cross-examination, not for traverse.  
14 MR. CARMOUCHE: I'll do it in cross, Your  
15 Honor.  
16 JUDGE PERRAULT: Let's go ahead and save it  
17 for cross.  
18 MR. CARMOUCHE: Okay.  
19 JUDGE PERRAULT: Is there an objection to  
20 this witness being admitted as an expert?  
21 MR. CARMOUCHE: No, Your Honor.  
22 JUDGE PERRAULT: No objection. She shall be  
23 admitted for the reasons cited earlier. There  
24 were too many for me to remember.  
25 MS. RENFROE: Just for the record, I'll be

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1 glad to recite them.  
2 JUDGE PERRAULT: Please.  
3 MS. RENFROE: Environmental data evaluation,  
4 environmental chemistry, human health risk  
5 assessment, and RECAP.  
6 JUDGE PERRAULT: Okay.  
7 MS. RENFROE: Thank you, Your Honor.  
8 REDIRECT EXAMINATION  
9 BY MS. RENFROE:  
10 Q. So Ms. Levert, did you perform a human  
11 health risk assessment under RECAP with respect to  
12 the Henning Management property in this case?  
13 A. Yes, I did.  
14 Q. So we're going to be talking about that  
15 in some detail. But before we get into that  
16 detail, I'd like you to give the panel and the  
17 judge a road map, just a high-level road map of  
18 your presentation today.  
19 A. Sure. So I'll start off with just a  
20 summary of the findings of my evaluation. And  
21 I'll talk about soil first and then groundwater.  
22 And then we'll do a bit of a deep dive into the  
23 methodology. And I promise to try to not put you  
24 to sleep. But we will do a little bit of a deep  
25 dive into the methodology, and I'll also talk

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1 about how my RECAP evaluation did specifically  
2 support our development of Chevron's most feasible  
3 plan that we've offered to the panel.  
4 Q. Ms. Levert, in evidence already is  
5 Exhibit 45, which is a copy of RECAP. Do you --  
6 you have a copy of RECAP with you?  
7 A. Yes. Yes, yes, yes.  
8 Q. You have your own personal copy with  
9 you?  
10 A. I have my own personal copy.  
11 Q. Your working copy. Got to keep your  
12 voice up for me.  
13 A. Okay.  
14 Q. I'm not going to burden you with another  
15 copy of this, but if the panel members need their  
16 own copy of RECAP, we're happy to provide it.  
17 So with that, then, what I'd like to do  
18 is ask you to give the panel a high-level kind of  
19 an executive summary overview of your RECAP  
20 evaluations with -- starting with soil.  
21 A. Sure. So for soil, our evaluation under  
22 RECAP included all of the data that was collected  
23 in the admission areas. And that evaluation  
24 indicates to us that the concentrations in soil  
25 uniformly are below the MO-2 RECAP standards for

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1 nonindustrial and residential land use.  
2 JUDGE PERRAULT: Please speak louder.  
3 A. With regard to salt in soil, it's not  
4 as -- I think it was Dr. Kind who talked about  
5 this -- that's not a concern for us for direct  
6 human contact. But our focus for salt in soil,  
7 then, is groundwater protection. And our  
8 evaluation of salt in soil above the shallow  
9 water-bearing zone and looking at soil in the  
10 deeper profile demonstrates that salt is  
11 protective of the shallow Class 3 groundwater and  
12 does not pose a risk to the deeper Chicot Aquifer.  
13 BY MS. RENFROE:  
14 Q. So I know you're going to take us into a  
15 very interesting and thorough tour of your RECAP  
16 evaluation. But again, to let the panel know what  
17 your opinion is, based on your RECAP evaluation of  
18 soils, is there any reason for corrective action  
19 for a human health risk reason?  
20 A. No. Based on the RECAP analysis, there  
21 is not a reason for a remediation to protect human  
22 health under RECAP.  
23 Q. Can you give the panel a high-level  
24 overview of your opinions, based on your RECAP  
25 evaluation, with respect to groundwater?

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1 A. Yes. With respect to groundwater,  
 2 constituents that are site-related constituents,  
 3 E&P-related constituents were identified in the  
 4 shallow water-bearing zone. And that  
 5 water-bearing zone isn't currently used for any  
 6 purpose beneath the site or within a mile of the  
 7 site. Our study indicates that it is Class 3  
 8 groundwater and, therefore, is not considered a  
 9 potential water supply, is not regulated as a  
 10 potential water supply under RECAP.  
 11 But we do, for Class 3 groundwater, look  
 12 at the potential for constituents in groundwater  
 13 to migrate and to potentially discharge to surface  
 14 water. Based on our geologic study at the  
 15 property, that's an incomplete pathway, given the  
 16 depth to groundwater. And so given that it is an  
 17 incomplete pathway, the constituents in  
 18 groundwater do not pose a threat to receiving  
 19 surface water body. And our delineation of the  
 20 constituents in the groundwater confirm that we  
 21 are not seeing migration to a receiving surface  
 22 water body.  
 23 Q. So based on your RECAP evaluation of  
 24 potential human health risk at the site, is there  
 25 any human health risk reason to remediate or

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1 perform any corrective action as to groundwater at  
 2 the site?  
 3 A. Not for purposes of human health.  
 4 Q. So let's now take our next step and  
 5 actually begin your tour of your RECAP risk  
 6 assessment. My first question to you is why did  
 7 you apply RECAP in doing your risk assessment?  
 8 A. There were several reasons. A primary  
 9 reason is that Chevron has committed to leaving  
 10 this property in a safe condition and a condition  
 11 that complies with the RECAP regulations. RECAP  
 12 is a tool that we use here in Louisiana to  
 13 evaluate the safety of property for human health.  
 14 So that is one driver for our application.  
 15 Another is that investigations at the site  
 16 generated data that go beyond the 29-B parameters  
 17 and are specifically addressed under RECAP. It is  
 18 our experience that DNR in the past has required  
 19 that when that's the case, these constituents be  
 20 evaluated using RECAP. And also, it's our  
 21 experience that the DNR has applied RECAP as an  
 22 applicable regulatory standard for public health  
 23 protection, which is a requirement of an MFP, by  
 24 definition of an MFP.  
 25 So RECAP is the tool that allows us to

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1 look at public health protection. So those are  
 2 the reasons that we've done that here.  
 3 Q. Has the DNR recently issued a most  
 4 feasible plan that informed or guided your RECAP  
 5 risk assessment in this case?  
 6 A. Yes. And each time that we go through  
 7 this process, we learn more about the DNR's  
 8 practice in terms of applying that regulation.  
 9 The most recent MFP, the Newman MFP or the Drew  
 10 estate MFP, included a decision document that was  
 11 helpful to me as a RECAP practitioner, a risk  
 12 assessment practitioner, to understand  
 13 specifically how DNR has been using RECAP in the  
 14 past. I had observation from my own experience,  
 15 and what that decision document confirmed for me  
 16 is that DNR has recognized that that regulation  
 17 has applicable methods, evaluation methods, and  
 18 remediation standards for constituents that are  
 19 E&P constituents and sites, like E&P sites, and,  
 20 therefore, the DNR has used RECAP as an applicable  
 21 regulation in their MFP process.  
 22 And in fact, that particular document  
 23 acknowledged that DNR has done so in all Act 312  
 24 matters where groundwater, for example, was an  
 25 issue. So that was confirmation for me about how

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1 to proceed with the use of RECAP in this process.  
 2 Q. Ms. Levert, have you reviewed all of the  
 3 submissions to DNR made by Henning Management as  
 4 well as Chevron?  
 5 A. Yes, I have, as part of this project,  
 6 yes.  
 7 Q. So you've actually read the proposed  
 8 most feasible plan submitted by Henning  
 9 Management?  
 10 A. Yes, I have.  
 11 Q. Does the Henning Management proposed  
 12 most feasible plan, is it based on a RECAP risk  
 13 evaluation like the one you've done?  
 14 A. No. The Henning plan does not rely on a  
 15 RECAP evaluation, and it does not include a RECAP  
 16 evaluation as part of that plan.  
 17 Q. So the Henning Management proposed most  
 18 feasible plan is not a human health risk-based  
 19 plan, is it?  
 20 A. It is not.  
 21 Q. So let's move now to the steps that you  
 22 followed to perform your RECAP risk evaluation.  
 23 Before I ask you a question, I'm going to ask the  
 24 Court a question.  
 25 MS. RENFROE: Judge, we can go -- we're

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1 prepared to go as long as you and the panel  
 2 would like us to. I think we're going to  
 3 need to take about another hour for our --  
 4 JUDGE PERRAULT: Is this a good place for a  
 5 break?  
 6 MS. RENFROE: It is. Although we can keep  
 7 going if you'd like. It's the pleasure of  
 8 the Court.  
 9 JUDGE PERRAULT: Y'all want to take lunch  
 10 now?  
 11 PANELIST OLIVIER: I think it's a good time,  
 12 if everybody agrees, since it's 12:00.  
 13 JUDGE PERRAULT: Let's break now and then  
 14 we'll come back at 1:00 o'clock.  
 15 (Lunch recess taken at 11:58 a.m. Back on  
 16 record at 1:05 p.m.)  
 17 JUDGE PERRAULT: We're back on the record.  
 18 Today's date is February 7th, 2023.  
 19 It's now 1:05. We just had a lunch recess.  
 20 This is Docket 2022-6003 in the matter of  
 21 Henning versus Chevron. I'm Charles  
 22 Perrault, administrative law judge, and I  
 23 would like Counsel to continue your direct  
 24 exam of your witness Angela Levert.  
 25 MS. RENFROE: Thank you. Good afternoon,

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1 Your Honor. Good afternoon, members the  
 2 panel and Ms. Levert. Thanks for coming  
 3 back.  
 4 THE WITNESS: Yes.  
 5 BY MS. RENFROE:  
 6 Q. Let's now start your tour, giving the  
 7 panel a tour of your RECAP human health risk  
 8 assessment. So if you would, describe the steps  
 9 and tell us what you have on your slide 7.  
 10 A. Sure. This flow chart is just a really  
 11 basic overview of the steps that I've taken and  
 12 the scope of the work that I've done specifically  
 13 for this evaluation. And you'll recognize it as a  
 14 typical, common flow chart for the RECAP process  
 15 if you guys have reviewed some of these in the  
 16 past.  
 17 The first step, of course, is the data  
 18 collection. And I just want to point out that at  
 19 this particular site, at the Henning site, we did  
 20 take some steps as part of the data collection to  
 21 specifically generate data that would support  
 22 human health risk evaluation, a RECAP evaluation.  
 23 That was one of our objectives. We then went into  
 24 a data usability, data quality review; and of  
 25 course, the objective of that step is to confirm

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1 that the data that we have available to us meets  
 2 what in RECAP we call definitive data, the  
 3 requirements for definitive data; that is, they  
 4 are reliable, reproducible, verifiable and that  
 5 supports us relying on that to make a conclusion  
 6 about risk and about remediation for the site.  
 7 So once we've identified the data set  
 8 that we consider to be valid, we carried that  
 9 through a screening step for both soil and for  
 10 groundwater and then moved in to management  
 11 options for each of those media. And, of course,  
 12 the outcome of that whole process is to identify  
 13 whether or not there are constituents in areas  
 14 that would constitute what we call a final AOI, a  
 15 final AOI that requires some sort of management,  
 16 remediation, exposure control, any sort of further  
 17 action as opposed to no further action.  
 18 Q. Now, did you perform each and every one  
 19 of these steps for your RECAP analysis of the  
 20 Henning Management site?  
 21 A. Yes. Yes, I did.  
 22 Q. After performing all of these steps,  
 23 what conclusion did you reach about whether any  
 24 corrective action is needed for human health risk  
 25 purposes at this site?

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1 A. We did not identify any final AOIs; that  
 2 is, areas that were in excess of the final RECAP  
 3 standards and require action to comply with the  
 4 health-based standards of RECAP.  
 5 Q. So let's now focus a little more  
 6 specifically on the first two steps; that is, the  
 7 data collection and the data validation.  
 8 Can you share with the panel your  
 9 observations about the data collected and whether  
 10 that data, that data set, supports a RECAP  
 11 evaluation?  
 12 A. Yes. Mike Purdom shared a lot of  
 13 information about our program in general, but I  
 14 want to take a look at it from the RECAP  
 15 perspective and share what my observations are  
 16 about that.  
 17 First, the data set that was generated  
 18 here -- and this is true in general when we  
 19 investigate E&P sites and sites for RECAP, in  
 20 general, all kinds of sites. The data set was  
 21 generated by what we would call a biased sampling  
 22 design. So both ICON and ERM went to places on  
 23 the property where we expected that there was the  
 24 greatest potential for impact, so in the footprint  
 25 of historical activities, pits, tank batteries.

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<p style="text-align: right;">Page 381</p> <p>1 That presents -- that provides a biased data set.  2 Now, that's consistent with our objectives for  3 RECAP, which are to make sure that we are  4 characterizing the property in a way that allows  5 us to do a conservative, protective human health  6 evaluation.  7 Our program, ERM's program, included  8 components of both sampling and laboratory  9 analysis, as I mentioned, to support specifically  10 RECAP evaluation. And I've listed some examples  11 here on the slide in these bullets.  12 And the first example is we performed  13 extensive delineation with the objective of  14 generating a data set that we believe would  15 satisfy the requirements of RECAP for delineation  16 and also based upon our experience with what the  17 DNR has requested in past plans. So that was the  18 objective of our delineation, to try to satisfy  19 RECAP requirements and your needs in terms of  20 satisfying your requirements for delineation as we  21 have experienced those in the past.  22 With regard to hydrocarbons and  23 fractions, I just want to point out that two  24 bodies of data were collected to characterize TPH.  25 Dr. John Kind talked about that. ERM generated</p>	<p style="text-align: right;">Page 383</p> <p>1 in your opinion, in performing RECAP risk  2 evaluations, do you think that the data collected  3 for this site supports a RECAP evaluation?  4 A. I do. I think we have good lateral  5 distribution of the sampling. I think the  6 sampling constituent list was appropriate for an  7 E&amp;P site. We pursued vertical delineation in  8 clinical locations as well. So I do feel like  9 this data set supports a full RECAP evaluation.  10 Q. So to sum it up, you feel like there was  11 a sufficiently robust data set to perform a valid  12 RECAP evaluation?  13 A. Yes, and part of our plan, I know you're  14 aware, includes a little bit of additional  15 delineation and that will refine that  16 understanding. But I do feel this body of data  17 allowed us to form opinions about risk and form  18 opinions about whether or not remediation is  19 necessary to comply with the risk-based standards.  20 Q. So moving, then, to the second step;  21 that is, the data validation and quality usability  22 review. So after collecting the data that you've  23 described, how did you then go about evaluating  24 the reliability or usability of it?  25 A. Data quality review is a standard step</p>
<p style="text-align: right;">Page 382</p> <p>1 fraction data, including in the full G, D and O  2 ranges, so we feel like we do have a data set that  3 allows us to use the most robust kind of  4 characterization of hydrocarbons for risk  5 assessment purposes, and that is the fractions.  6 We also did collect indicator  7 parameters, PAHs in soil and BTEX in groundwater,  8 to support the quantitative risk assessment.  9 Q. Ms. Levert, in addition to considering  10 the data set generated by ERM that you just  11 described, did you also consider the data  12 generated by ICON in your risk evaluation?  13 A. Yes, I did. We did not exclude the ICON  14 data.  15 Q. Is it important in your experience doing  16 risk assessments, and particularly risk  17 assessments under RECAP, to consider all of the  18 data?  19 A. Yes. I mean, if we don't, we're failing  20 to take in the full picture and that doesn't give  21 us the ability to provide as much information as  22 we actually have available for the site. And so  23 yes, I agree, it's important to use all of that  24 information.  25 Q. Now, having reviewed all of that data,</p>	<p style="text-align: right;">Page 384</p> <p>1 of a risk assessment; in fact, it's a required  2 step of RECAP and risk assessment in general. And  3 really, any data-driven scientific exercise, data  4 quality review would be part of that program.  5 Our data quality review included looking  6 at components like the laboratory methods that  7 were employed, were they appropriate? The  8 laboratory QC; that is, their performance of those  9 methods, does it meet quality objectives?  10 Representativeness of the data, we looked at  11 comparability of the data, the split data set.  12 Those are examples of our data quality review.  13 Q. Now, can you tell us what observations  14 you reached about the usability of the data set  15 for the Henning Management site?  16 A. Yeah, overall, this is a robust data set  17 and of good quality, supportive of human health  18 risk assessment. I do have some specific quality  19 observations or really they're usability  20 observations. And as part of the RECAP process,  21 we are to communicate any limitations that we see  22 in the data set, and that's what I'm prepared to  23 do here.  24 Q. So can -- let's talk about the first of  25 those observations.</p>

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1 A. Yeah, sure. So when we compared the  
 2 metals data sets for soil; that is, the ICON data  
 3 set versus the ERM data set, and did so in like  
 4 units, we identified that the ICON data set was  
 5 consistently higher than the ERM results. Now,  
 6 ICON and ERM actually use the same lab here. We  
 7 don't always have that situation. So we had a  
 8 good opportunity here to really study what's going  
 9 on and to put the data sets side by side because  
 10 it's the same lab and run in the same method.  
 11 There are 50 6010. The difference in the  
 12 execution of the method is that ICON requests that  
 13 the laboratory dry and grind the samples before  
 14 running it through 6010. And the ERM samples were  
 15 run as received. There was not a dry and grind  
 16 process. So ICON's results were reported in dry  
 17 weight after grinding. ERM's were reported in wet  
 18 weight; but, of course, the lab gives us moisture  
 19 content, so we're able to make the conversion. So  
 20 we can look at them dry weight/dry weight, and we  
 21 can look at them wet weight/wet weight.  
 22 The drafts that I'm showing you right  
 23 here are all in dry weight. And the only samples  
 24 that I've included in these drafts are the ones  
 25 where we have side-by-side split samples.

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1 The orange bars are the results for  
 2 ICON, and the blue bars are the results for ERM.  
 3 And so you can see that the blue bars are actually  
 4 greater than ICON's data -- ERM's results in about  
 5 80 percent of the samples. This is arsenic,  
 6 chromium, lead and zinc.  
 7 So that caused us to really look into  
 8 this just a little bit deeper. We engaged a data  
 9 quality, data review expert within ERM to take a  
 10 look and do an actual data validation per  
 11 functional guidelines and to just confirm that the  
 12 laboratory was executing their analysis on the ERM  
 13 samples appropriately. Now, I say "the ERM  
 14 samples," because we have the ability to ask the  
 15 lab to provide us their backup and their details  
 16 for the work that we commissioned from them. And  
 17 her validation indicated that the laboratory  
 18 properly executed the analysis and the data are  
 19 valid.  
 20 So let's go to the next slide. I want  
 21 to focus on barium because, as you know, that's  
 22 really the constituent that we're focused on in  
 23 the soil here. And we did see the same result  
 24 with barium, about 80 percent of the samples, the  
 25 ICON result was higher when looking at that in the

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1 same units. And that's what you see on the  
 2 left-hand side. And we actually saw a little bit  
 3 more of a difference in the barium results than  
 4 the other metals results.  
 5 Q. Let me interrupt you there.  
 6 A. Yeah.  
 7 Q. Do you expect to see the ICON data  
 8 results higher than the ERM data results?  
 9 A. Well, in like units, not consistently.  
 10 I mean, we expect to see variability and some ICON  
 11 results higher, some ERM results higher. But this  
 12 consistent -- and I will call it a bias, that the  
 13 results for ICON are biased high -- this  
 14 consistent bias is not really what we would  
 15 expect.  
 16 On the right-hand side, that's just  
 17 another way to look at the same data set. A red  
 18 diagonal line would be a one to one. In a perfect  
 19 world, both results were the same. ERM's  
 20 concentrations are on the X axis, ICON's on the Y  
 21 axis. The scattered dots are, by and large, above  
 22 the diagonal, indicating the concentrations are  
 23 higher in the ICON data set for most of the  
 24 samples than ERM. And that just indicates to us,  
 25 after studying the method, studying the details of

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1 this, it suggests to us that the grinding  
 2 component of the preparation is contributing to  
 3 this bias.  
 4 And that makes sense because when we  
 5 grind the samples, we create additional surface  
 6 area, smaller particles and additional surface  
 7 area for the acid to extract metals from those  
 8 particles. And we believe that's what is  
 9 contributing to this bias. And with regard to  
 10 barium, perhaps the reason that we are seeing a  
 11 greater difference here is, remember, barium --  
 12 barite, barium sulfate, which is what we've  
 13 identified to be present here in the soil, is a  
 14 crystalline structure. So the grinding is  
 15 breaking the crystals into smaller pieces,  
 16 creating additional surface area, allowing  
 17 additional extraction with the acid extraction,  
 18 giving a higher result for metals. So we believe  
 19 that's the explanation for the bias here, is that  
 20 grinding component of the preparation.  
 21 Q. So does the sampling method required by  
 22 RECAP, does it allow for the drying and grinding  
 23 preparation?  
 24 A. Well, it doesn't speak to that  
 25 specifically. What it does is it calls for a use

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<p style="text-align: right;">Page 389</p> <p>1 of method 6010 3050 extraction. So those are  2 appropriate. And actually, the 3050 method does  3 indicate that you may, you may perform drying and  4 grinding if samples are wet or damp and that  5 drying and grinding doesn't change the extraction  6 of your analytes, your target analytes. Okay? So  7 it allows for that.</p> <p>8 Well, our samples weren't -- they're not  9 sediment, they're not wet. They're of typical  10 soil moisture content, but more importantly, we  11 think that what this data set is telling us is  12 that when you examine the ground samples versus  13 the not, that the grinding is contributing to this  14 bias.</p> <p>15 Q. So the takeaway here so far is that  16 the -- at least in your view, it was the dry and  17 grinding preparation method that ICON instructed  18 the lab to use that likely explains why their  19 results are higher?</p> <p>20 A. Right. Right. But let me explain:  21 What does this mean for me? Well, I didn't  22 exclude their data set, their metals data set. I  23 carried the full data set through the RECAP risk  24 evaluation. This is a bias that I believe we're  25 seeing in this data set. And I want to share that</p>	<p style="text-align: right;">Page 391</p> <p>1 the panel and noting in your report?  2 A. Well, just a couple of things and they  3 are noted in my report. If we go to the next  4 slide, I think. With regard to the fractions,  5 RECAP Appendix D provides specific guidance on how  6 to do risk assessment for petroleum hydrocarbon  7 sites. And I just want to point out that that is  8 what we're relying on for our hydrocarbon risk  9 evaluation here. We do have a complete set of  10 fraction data; that is, data in each location  11 where the TPH mixtures were also analyzed. So I  12 feel like we can perform a complete evaluation per  13 RECAP Appendix D.</p> <p>14 And then the last one is just an  15 observation that some of the monitoring wells,  16 when we were sampling, resulted in turbidant  17 samples. That's true of some samples that were in  18 Area 1. It's true of the wells that purged dry.  19 So we did have challenges with turbidity which  20 doesn't meet the sampling quality objective. But  21 we, ERM, did filter the groundwater samples for  22 all of the locations. ICON also filtered some.  23 And both bodies of data are there in our report.  24 I've actually included both bodies of data in the  25 tables that I'm sharing as part of the risk</p>
<p style="text-align: right;">Page 390</p> <p>1 information with the panel. Barium is very often  2 a constituent of focus for us. Barite is the  3 constituent that is primarily found at these  4 sites. And so this is important to us.</p> <p>5 There's a question of whether or not  6 that method is representative of what's  7 environmentally available. Because that's what  8 this is all about. In fact, that's what the  9 method says. Method 3050, 6010 -- 3050 in  10 particular -- is after extracting and reflecting  11 what is environmentally available.</p> <p>12 Well, this probably doesn't represent  13 what's environmentally available.</p> <p>14 Q. Meaning the ICON barium data?  15 A. Right. In the field. In the ambient  16 environment. Okay? So in that sense, it's biased  17 high. Again, doesn't affect the conclusion of my  18 risk work. What it does affect is when we start  19 to look at delineation, as you might expect.  20 Because when we have these kinds of differences in  21 barium and we talk about delineation, it does  22 affect the way we view the data set for  23 delineation.</p> <p>24 Q. Were there any other observations about  25 the data set that you thought were worth noting to</p>	<p style="text-align: right;">Page 392</p> <p>1 evaluation. I wanted to bring your attention to  2 that as a daily usability item.</p> <p>3 Q. Now, you mentioned fraction data and  4 indicator data, which ERM collected. Correct?  5 A. That's correct. That's correct. Now  6 with regard to the groundwater, both parties did  7 run BTEX with regard to the soil. We returned to  8 the location where there was an exceedance of a  9 screening standard specifically to collect PAH  10 data in that location.</p> <p>11 Q. Okay. I may be getting a little ahead  12 of myself or ahead of you, but just briefly, tell  13 the panel why you collect fraction data and  14 indicator data for purposes of a RECAP risk  15 assessment.</p> <p>16 A. Sure. And I think that actually  17 Dr. John Kind did a really nice job of explaining  18 that these fraction data really give us the best  19 picture of what the site-specific composition of  20 hydrocarbon is at the site. That's important at  21 sites like this that are old and weathered because  22 the composition will vary, depending upon  23 weathering. And so in order for us to assign the  24 most appropriate tox factor to this material at  25 this site at this point in time, fractioning is</p>

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<p style="text-align: right;">Page 393</p> <p>1 the way to do that. And PAHs are one of the more  2 toxic components potentially that we find in  3 petroleum hydrocarbons, PAHs specifically. And  4 that is the reason we also collect that data  5 independently or -- or not independently but in  6 combination with the fraction data.  7 Q. Did any party or anybody involved with  8 the Henning Management site investigation other  9 than ERM collect fraction data and indicator data?  10 A. No, that was part of our program with  11 the objective specifically of supporting a RECAP  12 evaluation.  13 Q. So ICON didn't collect that data?  14 A. No. No.  15 Q. Okay. Now, despite the data quality  16 issue -- I shouldn't say data quality. I should  17 say usability observations that you just shared  18 with us, did you nevertheless consider all of the  19 data in your RECAP evaluation?  20 A. That's correct.  21 Q. In your opinion and based on your  22 experience working with DNR in -- with RECAP, if  23 someone attempts to perform a RECAP evaluation  24 without performing this kind of data quality and  25 data usability analysis, have they performed a</p>	<p style="text-align: right;">Page 395</p> <p>1 A. Sure. We have good information about  2 that. One of the best pieces of information are  3 those drone videos that are fantastic. Of course,  4 aerial photos of the property over time  5 historically. I've visited the site. Our team  6 has spent a good bit of time at the site, and that  7 allows us to know that currently, there's portions  8 of the property that are used for farming  9 specifically for rice, other portions are unused  10 right now. Portions that have been used in the  11 past for agriculture are fallow right now. So  12 that is the current use of the property. I'm  13 aware, from reading Mr. Hennings' testimony  14 through deposition, that there are recreational  15 hunting leases on the property. So agriculture  16 and recreational hunting are the uses that I'm  17 aware of.  18 Q. Okay. Now, what -- if you could tell  19 the panel, what scenario did you use for your soil  20 RECAP evaluation?  21 A. I'm using a nonindustrial scenario. And  22 the nonindustrial scenario, in RECAP, is a  23 residential scenario. That is, the parameters  24 assume an exposure in which a person lives on the  25 property, an adult, a child, and engages,</p>
<p style="text-align: right;">Page 394</p> <p>1 sufficient RECAP evaluation?  2 A. Well, I think that it would be deficient  3 in that it doesn't provide the ability to make  4 these kinds of observations and to observe where  5 we see bias or potential error, things that would  6 potentially affect decision-making regarding  7 things like delineation. So I think that would  8 fall short of not just the requirements of RECAP  9 but fall short of providing the full picture.  10 Q. Let's move now to the next step in your  11 RECAP evaluation, and that is your soil assessment  12 under RECAP.  13 A. All right.  14 Q. So can you explain to the panel the  15 areas at the Henning Management site that you  16 evaluated?  17 A. All right. So this would be just a  18 quick snapshot because you guys have seen this  19 before. But Areas 2, 4, 5, 6 and 8, the colored  20 outlined boxes, those are our admission areas.  21 I'm using the full body of data that was collected  22 for soil within those admission areas.  23 Q. Now, let's talk about what you -- what  24 your understanding is about how the site is being  25 used. What can you tell us about that?</p>	<p style="text-align: right;">Page 396</p> <p>1 interacts with the property physically 365 days a  2 year, 24 hours a day.  3 So, and I'm choosing to use that  4 nonindustrial residential scenario for a couple of  5 reasons. Number one, it addresses potential for  6 alternative land use. Not that we have an  7 indication right now that that's an intention.  8 That was not expressed in Mr. Hennings' testimony,  9 but it does address that potential. It's also the  10 most conservative standard that is provided in  11 RECAP in that it assumes the greatest amount of  12 exposure relative to residence -- residents  13 relative to industrial or recreational. So by  14 using this residential scenario, we are addressing  15 a full range of potential land uses in a  16 conservative way.  17 Q. All right. Now, with that in mind,  18 let's then -- if you would, walk us through your  19 screening analysis for soils at the property.  20 A. Sure.  21 THE WITNESS: Do you mind if I stand, Your  22 Honor?  23 JUDGE PERRAULT: Please proceed.  24 BY MS. RENFROE:  25 Q. And let's also maybe help direct the</p>

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<p>1 panel to a large printout of your table 11 in your  2 report, which is what we have on the screen at  3 Slide 16.</p> <p>4 A. Right. So this is table 11. And this  5 is taken straight from the report. And I know  6 that some of you guys have seen this structure of  7 table before in some of our prior reports for  8 projects.</p> <p>9 This is the screening table in which we  10 are comparing the maximum concentration that was  11 reported in soil in each of the admission areas.  12 And so that's what my columns are here, is each of  13 the admission areas with maximum concentrations  14 listed and compared to the screening standards  15 here. And our screening standards here address  16 both direct contact and groundwater protection.  17 So these are screening standards taken directly  18 from RECAP. And what I've highlighted in blue are  19 those concentrations that are above a screening  20 standard. We have one fraction, aliphatics 8 to  21 10 in one location, one area and one location  22 specifically, one sample, that exceeded a  23 screening standard. And you can see by this  24 comparison that barium is the primary constituent  25 of concern for further risk assessment at the</p>	<p>1 exposure concentration shall be evaluated in wet  2 weight. And for typical moisture contents, if  3 you're not talking about, for instance, a  4 sediment, a conversion to dry weight isn't  5 required for groundwater protection demonstration.  6 However, I did provide, in Appendix M, supporting  7 RECAP materials, a table in dry weight to compare  8 to the groundwater protection standards because I  9 know that's something we talk about in all of  10 these projects, so I wanted to make sure we  11 covered those bases. John Kind provided the  12 direct contact evaluation in dry weight. So we  13 have evaluated this data set in both ways. In  14 both ways.</p> <p>15 In addition, as part of the litigation  16 in this project, my expert report included a full  17 analysis in dry weight to confirm there's no  18 difference to the conclusions, whether we're  19 talking wet weight or dry weight.</p> <p>20 Q. You mentioned RECAP allows or calls for  21 the analysis to be done using wet-weight data.  22 Would that be RECAP Section 2.8.2.1 for anybody  23 who wants to look it up?</p> <p>24 A. That's right. That's right.</p> <p>25 Q. So after you did your screening step,</p>
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<p>1 property.</p> <p>2 Now, because barium in each of the areas  3 did exceed the default groundwater protection  4 standard, which is 2,000 for barium, we did  5 collect SPLP data to evaluate groundwater  6 protection in a site-specific way, right? So  7 that's a provision in RECAP. Especially for  8 metals, if there's an exceedance of a default  9 groundwater protection standard, SPLP is a way for  10 us to move forward with a site-specific evaluation  11 of leachability.</p> <p>12 And so we've done that, and in this row  13 here, listed under SPLP metals, you'll see SPLP  14 barium. These were the maximum concentrations  15 that were reported for barium in the leachate, and  16 I've compared it to the screening standard for  17 leachate. And that comparison indicates that the  18 leachate concentrations are considered protective  19 of groundwater for any classification and don't  20 require further evaluation for that pathway.</p> <p>21 Q. Did you -- are these results reported in  22 wet weight or dry weight?</p> <p>23 A. Oh, thank you for asking that. So this  24 table is expressed in wet weight. And that's  25 because RECAP, in its text, indicates that an</p>	<p>1 then tell us again which constituents did you  2 decide to carry forward into your management  3 option analysis?</p> <p>4 A. Right. Primarily barium and an  5 additional fraction aliphatics 8 to 10.</p> <p>6 Q. And what about barium as it relates to  7 groundwater protection?</p> <p>8 A. Right. So we've done our SPLP  9 evaluation. We've compared to the leachate  10 standard. That is our demonstration of  11 groundwater protection. I'll give a little more  12 detail about that SPLP data, how that collection  13 came about and what those are in a little bit.</p> <p>14 Q. My next question has to do with AOIs.  15 And the panel is very familiar with what we mean  16 by that; but for the record that we're making,  17 what does that stand for?</p> <p>18 A. The acronym is for "Area of  19 Investigation."</p> <p>20 Q. How did you identify your areas of  21 investigation under your -- for your RECAP  22 evaluation?</p> <p>23 A. So the AOI concept has a couple of  24 applications here. In the big sense, in the  25 big-picture sense, we talk about final AOI. And</p>

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1 when we looked at that flow chart I described,  
 2 that's what we're after in the end: Are there any  
 3 final AOIs, areas that exceed a final RECAP  
 4 standard? My conclusion regarding that is there  
 5 are no final AOIs for this site.  
 6 But as we make our way through the RECAP  
 7 process, there are points along the way where we  
 8 also think about the concept of an AOI. So, for  
 9 example, there is a preliminary, what we would  
 10 term a "preliminary AOI," associated with direct  
 11 contact. And that is based upon a comparison of  
 12 the data set to a direct contact screening  
 13 standard. That gives us a preliminary AOI. And  
 14 that is reflected in my figures 1 -- for barium,  
 15 our focus here is 10 -- I think it's figures 106  
 16 to 111, 111. I think we included those in your  
 17 package maybe.  
 18 Q. Yeah. We did.  
 19 MS. RENFROE: And let's see if we can bring  
 20 up Slide 25, Jonah, please.  
 21 BY MS. RENFROE:  
 22 Q. We'll advance to that slide in your  
 23 presentation and just show an example of one of  
 24 your AOIs.  
 25 A. The one before this; right. The slide

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1 before this.  
 2 MS. RENFROE: Slide 24, Jonah.  
 3 A. Yes. So this is an example. I don't  
 4 know if that's in your packet, but it is in the  
 5 full-risk evaluation. So what you see here is  
 6 we've posted all of the data that we have  
 7 available for barium, including all intervals,  
 8 laterally and vertically. And what we've  
 9 highlighted on this figure in blue is those  
 10 locations where there is an exceedance of the  
 11 default direct contact screening standard.  
 12 So that is a display of how I am  
 13 thinking through the AOI for direct contact. So  
 14 that's a picture of our AOI for direct contact.  
 15 Now, I didn't put a circle around it. I didn't  
 16 need to do that because I'm using maximum  
 17 concentrations, not attempting to calculate a 95  
 18 UCL or anything like that. But this is a display  
 19 of the preliminary AOI relative to direct contact  
 20 standard. Now, the yellow is a highlight of a  
 21 screening evaluation -- a screening level that  
 22 we're going to talk about for delineation  
 23 purposes. But it's the blue that reflect the  
 24 direct contact screening standard.  
 25 Now, with regard to groundwater

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1 protection, a preliminary AOI for groundwater  
 2 protection could be a comparison to the default  
 3 groundwater protection standard of 2000. But  
 4 because we took the step of collecting SPLP data,  
 5 we're performing a site-specific evaluation, and  
 6 there's not a need to identify that default  
 7 preliminary AOI for groundwater protection  
 8 purposes. We're using the leachate data to  
 9 evaluate groundwater protection.  
 10 BY MS. RENFROE:  
 11 Q. Thank you for that. I took us on a  
 12 little detour, but I thought that was important to  
 13 talk about right now.  
 14 MS. RENFROE: Jonah, can you return us to  
 15 Slide 16, please?  
 16 BY MS. RENFROE:  
 17 Q. Now, you mentioned Dr. Kind just a few  
 18 minutes ago. The panel heard from him yesterday  
 19 and he explained why he ruled out a pica  
 20 ingestion, and I want you to explain to this panel  
 21 why you did not utilize a pica ingestion rate in  
 22 your RECAP evaluation.  
 23 A. Sure. Sure.  
 24 It's because -- well, number one, I  
 25 didn't identify that to be applicable to the

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1 property currently. And based upon the  
 2 information that we had about the site and we have  
 3 about the site, there was not an intention  
 4 expressed by Mr. Henning to develop as  
 5 residential. So that's one component of it, but  
 6 the other component is, for a residential  
 7 evaluation in general under RECAP, the reasonable  
 8 maximum exposure scenario -- and that's a term in  
 9 RECAP that we are required to evaluate,  
 10 "reasonable maximum exposure" -- is the default  
 11 residential scenario. So you go to the screening  
 12 tables, you see the RME scenario for residential.  
 13 You go to the MO-1 tables, you see the RME  
 14 scenario for residential. And that is the  
 15 required analysis for a residential land use.  
 16 There is a provision in RECAP to apply  
 17 or evaluate pica, and it addresses when there has  
 18 been a very specific concern identified. It  
 19 provides for that kind of analysis. That hasn't  
 20 been identified at this property and that would  
 21 not be considered reasonable maximum exposure and  
 22 intended to apply broadly as a RECAP standard and  
 23 a remediation standard. When there is such an  
 24 observation, it is looked at and evaluated in a  
 25 very site-specific and localized way.

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1 Q. Now, you mentioned that you're using,  
 2 for your RECAP evaluation, a nonindustrial  
 3 scenario. So essentially when you were evaluating  
 4 potential human health risks at this property, you  
 5 were evaluating it as if it was a residential  
 6 property?  
 7 A. That's correct. And using RECAP's  
 8 reasonable maximum exposure scenarios, which, in  
 9 fact, is the same as EPA.  
 10 Q. All right. But to your knowledge, is  
 11 anybody residing on the property today?  
 12 A. No.  
 13 Q. And now, you mentioned Mr. Hennings'  
 14 deposition. You read Mr. Hennings' deposition for  
 15 your work in this case?  
 16 A. I did.  
 17 Q. I'd like to ask you -- I want to show  
 18 you some of the pages from it and ask if you  
 19 considered those.  
 20 MS. RENFROE: So, Jonah, can we go to the  
 21 Elmo, please?  
 22 BY MS. RENFROE:  
 23 Q. So here is the April 7, 2022 deposition  
 24 of Mr. Thomas Henning in the Henning Management  
 25 case.

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1 Now, is this the deposition that you  
 2 read?  
 3 A. Yes.  
 4 Q. And in doing that, did you read what he  
 5 had to say about -- at page 74, when he was asked  
 6 the question at line 10: "Do you have any  
 7 long-term plans for the property?"  
 8 A. Yes.  
 9 Q. And he answered: "You know, I have no  
 10 idea what the long-term plans could be."  
 11 And then he goes on to explain. Did you  
 12 read that?  
 13 A. Yes, I did.  
 14 Q. And then did you also read the question  
 15 and the testimony at page 75 of Mr. Hennings'  
 16 deposition where he was asked the question: "You  
 17 don't have any intention of turning it into a  
 18 residential subdivision or anything like that, do  
 19 you?" And he answered at line 9, "Not that, not  
 20 right now. I don't think it would sell very well  
 21 and -- because it's so far away from people."  
 22 Did you take that into consideration?  
 23 A. Well, I did generally. However, I still  
 24 elected to use the nonindustrial, the residential  
 25 scenario to provide a conservative evaluation for

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1 the property and because compliance with the  
 2 residential standards means that there will not be  
 3 a requirement for a restriction of use on the  
 4 property, no conveyance notice required.  
 5 Q. And then with respect to future uses of  
 6 the property, at page 194, Mr. Henning was asked  
 7 at line 20: "What do you think you want to do  
 8 with that property?"  
 9 Answer at line 22: "You know, you try  
 10 to put it back in production, but that's going to  
 11 cost a bunch of money."  
 12 So those are just some of the things  
 13 that Mr. Henning had to say. He said something  
 14 else at page 222 about his use of the property.  
 15 At line 24 or 23, he was asked: "Do you have any  
 16 plans for another big expenditure on the Walker  
 17 property?"  
 18 And he answered at line 25: "Other than  
 19 at one point, we were looking at doing a big bass  
 20 pond on this piece. And that was going to be a  
 21 million bucks, but we decided to put that on hold  
 22 because I bought that property down by White  
 23 Lake."  
 24 So I just want to make sure, Ms. Levert,  
 25 that in your performance of this RECAP evaluation,

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1 that you did consider all of his testimony about  
 2 potential uses of the property.  
 3 A. Yes. And based on the information that  
 4 we had, it's my opinion that this provides a  
 5 conservative and appropriate RECAP evaluation for  
 6 the property.  
 7 Q. Okay. And you didn't see anything in  
 8 Mr. Hennings' deposition testimony about the idea  
 9 that there was some pica child behavior on the  
 10 property, did you?  
 11 A. No.  
 12 Q. And you said you hadn't seen any  
 13 evidence that would justify the use of a pica  
 14 ingestion rate. I thought I heard you say that.  
 15 A. That's right. That's right. That is a  
 16 very specific evaluation.  
 17 Q. So there's got to be some evidence to  
 18 justify that, if I follow what you're saying?  
 19 A. Yes, that's correct because it's such a  
 20 variable and site-specific thing, that evaluation  
 21 requires a very focused review and examination  
 22 variable.  
 23 Q. In your experience doing RECAP risk  
 24 assessments for most feasible plans for  
 25 consideration by DNR, has DNR or even DEQ ever

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<p>1 asked you to use a pica ingestion rate?</p> <p>2 A. No, I've not been asked by DEQ or DNR to</p> <p>3 do a pica analysis, and particularly at an</p> <p>4 undeveloped site where we're looking at a</p> <p>5 hypothetical residential scenario. And I've</p> <p>6 closed many sites under a residential scenario,</p> <p>7 and pica simply hasn't been a concern.</p> <p>8 Q. And even for sites that you were not</p> <p>9 involved but for which DNR has issued a most</p> <p>10 feasible plan, have you ever seen DNR use, in a</p> <p>11 most feasible plan, a pica ingestion rate?</p> <p>12 A. No, I haven't seen that happen.</p> <p>13 Q. So then let's return to your tour and</p> <p>14 move to your Management Option 2 evaluation. So</p> <p>15 tell us what we're looking at here, please.</p> <p>16 A. So in this table, I'm showing you the</p> <p>17 development of the MO-2 standards, the components</p> <p>18 of that development, and then comparing the</p> <p>19 limiting or -- MO-2 RECAP standard to the maximum</p> <p>20 concentrations reported in the admission areas.</p> <p>21 And just like in the screening evaluation, we're</p> <p>22 looking at two components. We're looking at</p> <p>23 direct contact and then soil to groundwater</p> <p>24 protection. I've noted here we're using SPLP, the</p> <p>25 site-specific analysis for barium diffraction, I'm</p>	<p>1 toxicity factor is. It's a toxicity factor for</p> <p>2 the more mobile, soluble and toxic form of barium.</p> <p>3 That is the toxicity factor that is provided by</p> <p>4 EPA in the IRIS database. Our study of the site</p> <p>5 indicates that that is not the form of barium that</p> <p>6 we're talking about here in soil. However, I've</p> <p>7 used that factor in developing the residential</p> <p>8 standards for this site, to be conservative.</p> <p>9 Q. Has DNR previously approved of your use</p> <p>10 of that updated barium toxicity factor?</p> <p>11 A. Yes. Yes. And DEQ as well. That's a</p> <p>12 routine -- an appropriate substitution.</p> <p>13 Q. So based on your Management Option 2</p> <p>14 Evaluation of Soils that you're presenting here on</p> <p>15 table 2, what conclusion did you reach about</p> <p>16 whether remediation is needed?</p> <p>17 A. My conclusion is that the concentrations</p> <p>18 are below the limiting RECAP standards under MO-2</p> <p>19 for nonindustrial land use and that remediation</p> <p>20 wouldn't be required to comply with those RECAP</p> <p>21 standards.</p> <p>22 Q. Now, let's move to the next -- the next</p> <p>23 step in your process.</p> <p>24 A. Yes.</p> <p>25 Q. And you mentioned the SPLP screening</p>
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<p>1 actually showing the value straight out of RECAP.</p> <p>2 Now, under the MO-2 and any management</p> <p>3 option evaluation, this is where we recognize what</p> <p>4 the site-specific groundwater classification is.</p> <p>5 So the change in the groundwater protection</p> <p>6 standard from the screening to here is now we're</p> <p>7 looking at an underlying Class 3 groundwater.</p> <p>8 That's what we're looking at here for groundwater</p> <p>9 protection. And what I'm showing is that the</p> <p>10 maximum concentrations that were reported in each</p> <p>11 of the admission areas is below the RECAP MO-2</p> <p>12 residential standard.</p> <p>13 Now, at this point in a management</p> <p>14 option, we could do an upper confidence limit and</p> <p>15 average an upper confidence limit to evaluate the</p> <p>16 risk and compare more of an average concentration</p> <p>17 to the standard, but I didn't take that step. I</p> <p>18 didn't need to because the maximums were below.</p> <p>19 Q. One question I forgot to ask you. Why</p> <p>20 did you choose Management Option 2 as opposed to</p> <p>21 Management Option 1?</p> <p>22 A. Well, this is a Management Option 2</p> <p>23 because we have plugged in the current toxicity</p> <p>24 factor for barium. Now, given Dr. Connelly's</p> <p>25 discussion, let me maybe make clear what that</p>	<p>1 analysis for barium.</p> <p>2 A. Yes.</p> <p>3 Q. So I'd like to ask you now to explain</p> <p>4 why you collected SPLP data for barium?</p> <p>5 A. I want to tell you about the body of</p> <p>6 data that we have to demonstrate groundwater</p> <p>7 protection because I think that's important at</p> <p>8 this site for barium. These are the sample</p> <p>9 locations here (indicating) that we targeted for</p> <p>10 collecting SPLP data, leachate data for barium.</p> <p>11 And you can see that we targeted every area, every</p> <p>12 one of the admission areas because there were</p> <p>13 concentrations that exceeded the default RECAP</p> <p>14 screening standard of 2,000. So our aim is to go</p> <p>15 back to the location of highest concentration in</p> <p>16 those areas and to collect SPLP data.</p> <p>17 Well, in fact, we collected SPLP data</p> <p>18 not only at the highest -- although I'll talk</p> <p>19 about one additional goal of our program is to</p> <p>20 collect another sample here. But not only are we</p> <p>21 collecting data at the highest in this data set,</p> <p>22 we also have collected at some other elevated</p> <p>23 barium concentrations relative to that default</p> <p>24 standard.</p> <p>25 And so here's how this data set came</p>

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Page 413	<p>1 about. This is -- in this column, this is the</p> <p>2 total barium concentration in soil, total barium</p> <p>3 in milligrams per kilogram. The first result is</p> <p>4 ICON's and the second result is ERM.</p> <p>5 So as our data, ERM's data, was being</p> <p>6 reported to us from the lab, it's rolling in, it's</p> <p>7 coming in by e-mail, we're getting the lab</p> <p>8 reports, we're opening up the lab report. And we</p> <p>9 identified where there are concentrations above</p> <p>10 2,000. And we are selecting the locations in each</p> <p>11 of the areas in our data set where the</p> <p>12 concentrations are highest and above 2,000. Okay?</p> <p>13 So you can see that that happened for</p> <p>14 us, and we were able to, in realtime, call the</p> <p>15 lab, say: Run sample 24-S for SPLP. Okay?</p> <p>16 So that happened in several locations.</p> <p>17 24-S is one. That's our result (indicating).</p> <p>18 Q. You're pointing to 3350?</p> <p>19 A. 3350.</p> <p>20 19NE is one. Our result was 27E. 4E2</p> <p>21 is one. Our result was 3920. So we triggered the</p> <p>22 results.</p> <p>23 Well, these results where there's only</p> <p>24 one result showing are locations where ICON</p> <p>25 collected samples but didn't give us split</p>	Page 415	<p>1 that one. We don't have an SPLP sample there.</p> <p>2 Our plan says we want to go back out to the field</p> <p>3 and collect an SPLP sample in that location.</p> <p>4 Obviously, we have some SPLP results at other</p> <p>5 locations in that area where there was 3490, 294,</p> <p>6 5460, but we're proposing to go back to that</p> <p>7 location.</p> <p>8 Q. In Area 6?</p> <p>9 A. In Area 6. Okay. So that's how this</p> <p>10 data set was generated. The results are here in</p> <p>11 milligrams per liter. These are leachate</p> <p>12 concentrations, and I've compared to the leachate</p> <p>13 screening standard here of 40. And the full body</p> <p>14 of data is below the leachate screening standard</p> <p>15 of 40, demonstrating compliance with the</p> <p>16 groundwater protection standard.</p> <p>17 Q. Now, does use of SPLP data in lieu of</p> <p>18 screening standards, is that allowed under RECAP?</p> <p>19 A. It's allowed under RECAP. It's</p> <p>20 encouraged by DEQ. I know it's something that DNR</p> <p>21 has requested as part of MFPs and regular</p> <p>22 nonlitigation projects in the past. It is a</p> <p>23 preferred way to evaluate the mobility of metals</p> <p>24 in soil on these projects.</p> <p>25 Q. And for the benefit of the panel, is the</p>
Page 414	<p>1 material. There wasn't enough material, we don't</p> <p>2 have a split. So it wasn't until much later</p> <p>3 ICON's data comes across to us. We used that data</p> <p>4 set and went back to the field to the GPS</p> <p>5 coordinates of those locations and collected SPLP</p> <p>6 data. And so ones where there was only one value,</p> <p>7 that's an ICON data. We went back to the field to</p> <p>8 get data.</p> <p>9 And then there's one other scenario, and</p> <p>10 that is when that ICON data set came in and we did</p> <p>11 have splits, there's a number of locations where</p> <p>12 ERM's result was not above. ICON's result is</p> <p>13 above. ICON's result is above, above, above. So</p> <p>14 we went back to the field and went to those GPS</p> <p>15 coordinates, collected a sample and ran SPLP. And</p> <p>16 that is the basis for this body of data. So it's</p> <p>17 an iterative thing, not a perfect process</p> <p>18 probably, but this is the way in which this data</p> <p>19 set was generated. And I feel that this data set,</p> <p>20 by stepping through that process, going back out</p> <p>21 to the field, we have a good body of data that's</p> <p>22 representative of the high-end concentrations of</p> <p>23 barium in soil.</p> <p>24 One exception here, we had a result of</p> <p>25 3310, they had a result of 6030. We didn't catch</p>	Page 416	<p>1 table that you're pointing at, is that included in</p> <p>2 your report?</p> <p>3 A. Yes, it's in the body of the report.</p> <p>4 It's actually a table within the narrative.</p> <p>5 Q. All right. So then let's now -- all</p> <p>6 right. Let's now move to the next step in this</p> <p>7 analysis. So we have Slide 19 on here. And so my</p> <p>8 question is, despite the SPLP screening analysis</p> <p>9 showing that barium concentrations in soil are</p> <p>10 protective of groundwater, did you also compare</p> <p>11 those concentrations to Groundwater 3 --</p> <p>12 Groundwater Class 3 standards?</p> <p>13 A. Yes. And my purpose in doing that is I</p> <p>14 know there's some discussion about dilution</p> <p>15 attenuation factors, what are appropriate factors?</p> <p>16 Those sorts of questions. And of course, they're</p> <p>17 good questions.</p> <p>18 With regard to this particular property,</p> <p>19 these leachate standards are below the Class 3</p> <p>20 leachate standard without applying a dilution</p> <p>21 attenuation factor. They are below the Class 3</p> <p>22 standard, which is 45 milligrams per liter. So</p> <p>23 that is an SPLP leachate standard prior to</p> <p>24 applying any sort of dilution and attenuation</p> <p>25 factor. So what this tells me is: We have</p>

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<p style="text-align: right;">Page 417</p> <p>1 confidence that, for this particular site and this  2 classification of groundwater, the leachate  3 concentrations are protected by this measure. But  4 that's only one component of our study of the  5 groundwater protection.  6 A huge component of our study of that is  7 the distribution of barium in the soil. Barium is  8 exclusively found in the upper 2 feet. There  9 might be two or three samples where concentrations  10 of barium in the 2-to-4-foot interval were above  11 550. What does that tell us? The barium is not  12 mobile. It's not leaching significantly  13 vertically. It's not mobile. It's consistent  14 with our understanding that this is barium  15 sulfate. It's consistent with our understanding  16 that this is not a mobile form of barium. This is  17 supported by the groundwater data set, which shows  18 that there is one location on the property where  19 barium is above the screening standard. One. And  20 only one other location immediately adjacent to it  21 where the barium is elevated.  22 Looking across the whole rest of the  23 property, we don't see that. Instead, we see  24 concentrations that are very, very similar to  25 background and, in our opinion, do likely</p>	<p style="text-align: right;">Page 419</p> <p>1 experience with oil and gas E&amp;P sites, are there  2 constituents that you commonly see at these sites  3 that you routinely encounter as part of your RECAP  4 evaluation?  5 A. Yes. Yes. And I know you guys know  6 them by heart. They are hydrocarbons, barium and  7 salt. So I thought it might be helpful to hit  8 each one of those and just talk about how those  9 occur at this site and how they are addressed in  10 our plan, in Chevron's most feasible plan.  11 Q. So you investigated the potential health  12 risks from those compounds as well?  13 A. Correct. Correct. That's all part of  14 the RECAP evaluation, you bet.  15 Q. So let's, then, start with the  16 hydrocarbons. Tell the panel about your  17 characterization of hydrocarbons at the site.  18 A. Yes. So that is really brief because  19 there was very little of it. There are no  20 exceedances of 1 percent for oil and grease. We  21 had no observations of NAPL. In fact, there was  22 very little observation of evidence of  23 hydrocarbons in the boring logs when we were  24 completing our investigation. Where we saw it or  25 smelled it, samples were collected, and I've</p>
<p style="text-align: right;">Page 418</p> <p>1 represent natural conditions. So we're not seeing  2 a groundwater protection concern with barium in  3 those upper 2 feet of soil.  4 Q. So would you say that the data set that  5 you've described as a whole confirms that barium  6 in soil is not posing a risk to the groundwater  7 beneath the property?  8 A. Yes, that's our conclusion.  9 Q. So let's now just take a minute and sum  10 up what you've -- what your conclusions are so far  11 at this stage of your RECAP evaluation.  12 A. So just to wrap up the soil, stepping  13 through the screening evaluation, we identified  14 two constituents of concern, barium being the  15 primary one and limited to the upper 2 feet.  16 Uniformly, the concentrations, including  17 maxes, are below the MO-2 nonindustrial; that is,  18 residential standard. And using that residential  19 standard, that allows us to see that the  20 concentrations are protected for a wide range of  21 property uses.  22 The concentrations also are protective  23 of that underlying shallow groundwater, the  24 Class 3 Groundwater.  25 Q. Now, Ms. Levert, based on your</p>	<p style="text-align: right;">Page 420</p> <p>1 listed the IDs of the samples where the  2 hydrocarbons were detected.  3 Where there was a single fraction above  4 a screening standard, ERM went back out, performed  5 delineation sampling laterally, vertically. I've  6 carried that data through the MO-2 evaluation and  7 demonstrated compliance with residential standards  8 and groundwater protection. So I think if I could  9 just kind of paint it with a broad brush. This  10 isn't much of a hydrocarbon site. It's not a  11 driver for additional investigation. It's not a  12 driver for risk.  13 Q. I'm taking us now to Slide 22 in your  14 presentation. Show us or tell us: Where was that  15 hydrocarbon exceedance on the property?  16 A. Right. So this is Area 4. Here's our  17 location, 15-R. The single exceedance is at 6 to  18 8 feet in H-15. And you can see that we came back  19 to the field, stepped out, put borings in all of  20 these locations. In our borings, we saw no  21 evidence of hydrocarbon in the shallower  22 intervals. We targeted 6 to 8 to perform the  23 delineation there. You can see our vertical  24 delineation at H-15. And so we have a good body  25 of data to really get an understanding of the</p>

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<p>1 distribution and the absence of hydrocarbon as you</p> <p>2 move away from that single point.</p> <p>3 Q. Let's move now to barium.</p> <p>4 Tell the panel about your</p> <p>5 characterization of barium at the site.</p> <p>6 A. Right. So barium, being a primary COC,</p> <p>7 Dr. Connelly talked about one of the first and</p> <p>8 important steps that we put on our</p> <p>9 characterization list, and that was: Let's get</p> <p>10 some speciation data and understand what form this</p> <p>11 barium is in.</p> <p>12 We selected a couple of the locations</p> <p>13 where the concentrations were highest and</p> <p>14 submitted that for speciation. The result</p> <p>15 indicated barium sulfate. That's consistent with</p> <p>16 what we expected, with what we've seen at other</p> <p>17 sites. It's consistent with the distribution of</p> <p>18 barium in the soil column; yet, I performed the</p> <p>19 RECAP evaluation using the RFD for the more toxic</p> <p>20 form of barium to provide a conservative standard</p> <p>21 for closure of the site.</p> <p>22 Q. All right. So now, can we talk about</p> <p>23 the delineation of barium?</p> <p>24 A. Yes.</p> <p>25 Q. Because I wanted to ask you, I want to</p>	<p>1 a more conservative screening objective. I've</p> <p>2 developed an updated screening value for barium by</p> <p>3 simply plugging in that updated tox factor for</p> <p>4 barium into the RECAP screening algorithms. When</p> <p>5 I do that, the screening standard becomes 1600</p> <p>6 milligrams per kilogram instead of 550. And</p> <p>7 that's using the updated tox factor. I think</p> <p>8 that's a conservative benchmark for delineation</p> <p>9 here. It's well below the 5500. It's actually</p> <p>10 less than the default groundwater protection</p> <p>11 screening standard of 2,000. It's a protective</p> <p>12 and conservative value for us to use in developing</p> <p>13 a delineation plan that we're thinking, hopefully,</p> <p>14 will satisfy your needs in understanding the</p> <p>15 distribution of barium and its potential risk in</p> <p>16 accordance with RECAP. That was our basis for the</p> <p>17 delineation plan that we're providing to you.</p> <p>18 Q. So then let's talk about the -- we've</p> <p>19 talked about the delineation to some extent and</p> <p>20 you mentioned that barium was vertically</p> <p>21 delineated, so -- if I followed you correctly,</p> <p>22 both vertically and horizontally. So I'd like you</p> <p>23 to explain to the panel what it is you're</p> <p>24 presenting here on this Slide 24 regarding the</p> <p>25 delineation of barium.</p>
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<p>1 make sure --</p> <p>2 A. Thank you.</p> <p>3 Q. -- that we understand, that you convey</p> <p>4 your testimony to the panel about whether barium</p> <p>5 is sufficiently delineated both horizontally and</p> <p>6 vertically.</p> <p>7 A. I mentioned the fact that the</p> <p>8 differences that we're seeing in some of the</p> <p>9 barium samples may affect the way that we view</p> <p>10 delineation. I just want to share my observations</p> <p>11 about that and how we have approached delineation</p> <p>12 at the property for barium.</p> <p>13 Because we've performed an MO-2 RECAP</p> <p>14 evaluation here, RECAP requires that we be</p> <p>15 delineated to below the MO-1 standards. And for</p> <p>16 barium, that's 5500 milligrams per kilogram.</p> <p>17 Using the ERM data set, our concentrations</p> <p>18 currently are delineated to below the MO-1</p> <p>19 standard, so we have met that delineation</p> <p>20 standard. When I bring in the ICON data set,</p> <p>21 there's only two locations that I would</p> <p>22 describe -- with that benchmark: 5500 -- that</p> <p>23 delineation is not complete.</p> <p>24 But for purposes of developing the MFP</p> <p>25 that we've provided to you guys, we elected to use</p>	<p>1 A. Sure. So just revisiting this same</p> <p>2 picture or figure that we looked at before but</p> <p>3 this time with a little bit of a focus on the</p> <p>4 vertical. So in those figures 106 through 111,</p> <p>5 you'll find, again, that we have highlighted --</p> <p>6 and this time you can focus on the yellow -- we've</p> <p>7 highlighted those locations and concentrations</p> <p>8 that are above our 1600 delineation goal. And</p> <p>9 you'll see that -- just by quickly scanning,</p> <p>10 really, where we have borings providing us deeper</p> <p>11 samples that the concentrations below the zero to</p> <p>12 2-foot interval are less than that 1600</p> <p>13 delineation standard. And this is true as you go</p> <p>14 through all of those figures, 106 through 111. So</p> <p>15 it was striking to us how very limited barium is</p> <p>16 to the surface at this property.</p> <p>17 And Mike Purdom talked a bit about why</p> <p>18 we believe that's the case. And if you look at</p> <p>19 the historical aerals, you can see the reworking</p> <p>20 of the surface for preparation for agriculture in</p> <p>21 Areas 2, 4, 5, and 8. So we believe that's likely</p> <p>22 a contributor to this distribution.</p> <p>23 Q. So then looking at the next image here,</p> <p>24 the next slide, which is Slide 25 in the</p> <p>25 presentation, this one is now showing both Areas 2</p>

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<p style="text-align: right;">Page 425</p> <p>1 and 4 --</p> <p>2 A. That's right.</p> <p>3 Q. -- together.</p> <p>4 A. And in this, I was just wanting to share</p> <p>5 my observations with regard to the delineation and</p> <p>6 the meaning of the two bodies of data that we had</p> <p>7 for barium to characterize this site. And now I'm</p> <p>8 looking at this with the data set in the same</p> <p>9 units. I've pulled off the posting of</p> <p>10 concentrations just to make this less busy. At</p> <p>11 each of the dots on the map, we do have barium</p> <p>12 samples collected, and the yellow halos indicate</p> <p>13 where, in the ERM data set, there is an exceedance</p> <p>14 of that 1600 screening value. Okay? So that's</p> <p>15 where we have an exceedance.</p> <p>16 The orange halo is an ICON data point.</p> <p>17 That's where we don't have splits. So I couldn't</p> <p>18 evaluate that with an ERM data point. So I've</p> <p>19 actually put it on the map in a dotted orange</p> <p>20 line.</p> <p>21 This study indicated to us that we had</p> <p>22 reasonable delineation to that 1600 screening</p> <p>23 standard using the ERM data set, so not just the</p> <p>24 5500 but the 1600 with the ERM data set here.</p> <p>25 And then when I pull in the ICON data</p>	<p style="text-align: right;">Page 427</p> <p>1 throughout that area. And we have orange, we have</p> <p>2 yellow halos, full body of data. We are</p> <p>3 collecting a good number of samples for additional</p> <p>4 refinement of the distribution of barium in</p> <p>5 Area 6.</p> <p>6 Q. So now final area, Area 8.</p> <p>7 A. Yeah. And this area is more like Area 6</p> <p>8 than the others in that, using both bodies of</p> <p>9 data, we have kind of a broad footprint. This is</p> <p>10 the area that was prepared for rice cultivation</p> <p>11 and is currently being farmed for rice. And we</p> <p>12 have proposed, again, a broad step-out program to</p> <p>13 provide additional delineation data, get an</p> <p>14 additional understanding of the distribution of</p> <p>15 barium in Area 8.</p> <p>16 Q. So if I can, just to make -- just to</p> <p>17 wrap this up, on this piece, fair to say that ERM</p> <p>18 has delineated barium at the site with the ERM</p> <p>19 data to the applicable RECAP standard but</p> <p>20 because -- but you're proposing to -- you've got a</p> <p>21 plan in the most feasible plan to collect some</p> <p>22 additional samples to, I guess, fill out the</p> <p>23 delineation in light of the ICON samples?</p> <p>24 A. That's accurate. That's what we've done</p> <p>25 for this plan.</p>
<p style="text-align: right;">Page 426</p> <p>1 set, if you go to the next slide, that's the</p> <p>2 orange halos, it paints a little different</p> <p>3 picture. And this was part of our thinking and</p> <p>4 part of our consideration in providing a plan to</p> <p>5 you, and we elected to use that data in</p> <p>6 identifying additional delineation points. And</p> <p>7 you can see that we've proposed additional</p> <p>8 delineation on the western side of Area 2 and on</p> <p>9 the western side of Area 4.</p> <p>10 And we went through that same process in</p> <p>11 each of the admission areas.</p> <p>12 Q. So I'll show you -- let's look at now</p> <p>13 Areas 5 and 6.</p> <p>14 A. Right. And here, I'm showing you both</p> <p>15 data sets together, yellow halos, orange halos.</p> <p>16 Based upon this data set, the full data set, we've</p> <p>17 proposed additional delineation in Area 5 in the</p> <p>18 northeastern corner. In this area, which you can</p> <p>19 see --</p> <p>20 Q. And you're pointing out Area 6?</p> <p>21 A. I am.</p> <p>22 Q. Pardon the interruption.</p> <p>23 A. In this area, what you can see is</p> <p>24 impounded on these three sides by a levee, we see</p> <p>25 a distribution of barium that's kind of scattered</p>	<p style="text-align: right;">Page 428</p> <p>1 Q. So really to do an enhanced delineation</p> <p>2 in some places?</p> <p>3 A. Yes.</p> <p>4 Q. Let's move now to your discussion of</p> <p>5 salt. So switching gears to salt, tell the panel</p> <p>6 about your characterization of salt at the site,</p> <p>7 please.</p> <p>8 A. Okay. So the third of our common</p> <p>9 constituents here, you didn't see salt in the</p> <p>10 screening table or the MO-2 table and that is</p> <p>11 because it is not a direct contact concern, and we</p> <p>12 don't have default groundwater protection</p> <p>13 standards, right? So as a nontraditional</p> <p>14 parameter, we approached it a little bit</p> <p>15 differently in a site-specific way. Our primary</p> <p>16 focus for risk evaluation for salt is groundwater</p> <p>17 protection. We've addressed that in two ways at</p> <p>18 the Henning site: First is looking at protection</p> <p>19 of the shallow Class 3 zone and the second is</p> <p>20 looking at protection of the deeper Chicot</p> <p>21 Aquifer.</p> <p>22 Q. Tell us, how do you go about evaluating</p> <p>23 salts in soils at the site and what did you find?</p> <p>24 A. So let me talk about the protection of</p> <p>25 the shallow zone first; right?</p>

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<p style="text-align: right;">Page 429</p> <p>1 Because this is Class 3 groundwater, our  2 focus is really the potential for constituents to  3 migrate in groundwater to a surface water  4 receptor, pose a threat to a receiving surface  5 water body. So when we're thinking about salt in  6 the soil above that water-bearing zone, that's our  7 focus: What is the potential for the salt to  8 reach the Class 3 groundwater and move and  9 discharge to a surface water and pose a threat to  10 that water body? Our geologic model says that  11 pathway is incomplete because of the depth to  12 groundwater.</p> <p>13 So our primary conclusion here is the  14 residual salt concentrations in soil don't pose a  15 risk for that pathway. Our observation about the  16 salt occurrence in the vadose zone above that  17 shallow Class 3 groundwater is it's relatively  18 limited in the lateral footprint, but importantly,  19 it's not posing a risk to the  20 groundwater-to-surface-water pathway; however, we  21 did collect leachate data, SPLP leachate data, for  22 chlorides at locations where soil had elevated EC,  23 the highest EC concentrations, to provide the kind  24 of data that DNR has asked us to provide in the  25 past.</p>	<p style="text-align: right;">Page 431</p> <p>1 highest EC intervals in those locations. So we  2 have proposed to go back to those intervals and  3 collect SPLP data consistent with what we have  4 seen requested in prior plans from DNR.</p> <p>5 Q. Now, so far, based on what you've  6 described, is there any need for any corrective  7 action to address salts in soil on the property?</p> <p>8 A. For purposes of protecting the Class 3  9 groundwater, no.</p> <p>10 Q. So then let's talk about salts with  11 respect to the Chicot Aquifer. Did you evaluate  12 that?</p> <p>13 A. We did, we did.</p> <p>14 Q. How did you do that?</p> <p>15 A. There's multiple lines of evidence that  16 we're looking at here and that are important to  17 our interpretation of what is the potential for  18 salt to be leaching into the Chicot Aquifer. And,  19 of course, a big part of that is the vertical  20 delineation of salt. And there's several pieces  21 of evidence about that. There are the EC probe  22 logs. There's field EC data and there's lab EC  23 data. And we did purposely go to locations where  24 there was impact, salt impact identified above the  25 shallow water-bearing zone and in the shallow</p>
<p style="text-align: right;">Page 430</p> <p>1 I also did provide an example  2 calculation of a leachate standard, the Class 3  3 groundwater, to provide some context around those  4 concentrations that were detected in the leachate.  5 That's provided in the narrative, the text of my  6 document. Basically it assumes that there could  7 be a discharge to Bayou Lacassine, looks at a  8 distance associated with that analysis and applies  9 a dilution-attenuation factor to say: What does a  10 Class 3 leachate standard look like for chloride?  11 That information is also in the text of our  12 report.</p> <p>13 But again, the first conclusion here is  14 there's an incomplete pathway with regard to  15 groundwater-to-surface-water discharge.</p> <p>16 Q. So is it the case that -- or is it your  17 view, your conclusion, that salts in soil are not  18 a concern when it comes to consideration of  19 protection of a Class 3 groundwater?</p> <p>20 A. Right. The shallow groundwater zone,  21 that is Class 3 at this site.</p> <p>22 Now, we did, as part of our plan,  23 provide a plan to collect some additional SPLP  24 data. There are data available, SPLP chloride  25 available in Areas 4 and 5. We didn't catch the</p>	<p style="text-align: right;">Page 432</p> <p>1 water-bearing zone and completed borings deeper  2 into the confining clay below the shallow  3 water-bearing zone to capture the delineation  4 here.</p> <p>5 And in fact, both parties generated that  6 kind of data. And it demonstrates that the salt  7 is vertically delineated within that confining  8 clay and well above the Chicot.</p> <p>9 Now, we also studied the characteristics  10 of the Chicot, including the vertical  11 permeability, which we identified to be very  12 limited. We've studied the regional data  13 regarding the thickness of the Chicot, and it  14 demonstrates that this unit, this clay unit will  15 provide, in our opinion, a protection, a required  16 protection of that Chicot Aquifer.</p> <p>17 The residual salt concentrations do not  18 pose a threat to the Chicot Aquifer water quality.  19 The one last piece of information is we did  20 collect samples of clay in that confining unit  21 below the shallow water-bearing zone in locations  22 where the water-bearing zone is affected with the  23 chloride. We ran SPLP in those clay samples. We  24 did not identify the soil below that water-bearing  25 zone to be a reservoir for salt to continue</p>

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Page 433	<p>1 leaching at concentrations that would be a concern</p> <p>2 to the Chicot Aquifer.</p> <p>3 Q. So with respect to salts, based on your</p> <p>4 RECAP evaluation and your analysis, is there any</p> <p>5 need for corrective action to address salts at the</p> <p>6 site?</p> <p>7 A. No, not to comply with protective</p> <p>8 standards of RECAP, no.</p> <p>9 Q. So have we now completed your tour</p> <p>10 through your RECAP evaluation of soils?</p> <p>11 A. Yes.</p> <p>12 Q. Can you tell us, then, how that RECAP</p> <p>13 evaluation of soils at the Henning Management site</p> <p>14 supports the most feasible plan that's been</p> <p>15 submitted on behalf of Chevron to the DNR?</p> <p>16 A. Yes. The role of the RECAP evaluation</p> <p>17 in this plan really is to provide a couple of</p> <p>18 required supporting components. One is that RECAP</p> <p>19 is the applicable regulatory standard that</p> <p>20 addresses protection of public health, that being</p> <p>21 a requirement of a most feasible plan.</p> <p>22 So our application of RECAP, our</p> <p>23 inclusion of RECAP as a component of our plan, we</p> <p>24 believe, satisfies that requirement. And our</p> <p>25 analysis demonstrates that the site conditions are</p>	Page 435	<p>1 from soil to groundwater, I did want to ask:</p> <p>2 With everything that you considered, in your</p> <p>3 professional opinion, did you see anything</p> <p>4 that would deem SPLP to be not representative</p> <p>5 of these AOIs in this specific area?</p> <p>6 THE WITNESS: No. No. I would say no, we</p> <p>7 did not.</p> <p>8 And really, you know, when we think</p> <p>9 about all the data that's available to us,</p> <p>10 that vertical delineation of barium really</p> <p>11 supports what we conclude from that leachate</p> <p>12 analysis. Our leachate analysis says: Okay,</p> <p>13 this provides us an understanding of the</p> <p>14 potential for the partitioning. And then the</p> <p>15 vertical delineation combined with that says:</p> <p>16 Very limited mobility.</p> <p>17 So I think it's that full body of data,</p> <p>18 but the SPLP analysis itself, in my opinion,</p> <p>19 is absolutely applicable here and reflects --</p> <p>20 is representative of the potential mobility.</p> <p>21 PANELIST OLIVIER: When you talk about</p> <p>22 mobility, are you talking about barium and</p> <p>23 also chlorides?</p> <p>24 THE WITNESS: Oh, yes. So chlorides too.</p> <p>25 Let me think. Did I answer your question</p>
Page 434	<p>1 protective of public health in accordance with</p> <p>2 RECAP.</p> <p>3 The second component is we are using</p> <p>4 RECAP to identify alternative standards for salt</p> <p>5 below the root zone; that is, alternative to the</p> <p>6 agronomic 29-B standard, we are proposing to use</p> <p>7 the RECAP risk-based evaluation of groundwater</p> <p>8 protection for underlying groundwater.</p> <p>9 Q. Ms. Levert, based on your RECAP</p> <p>10 evaluation of soils at the site, at the Henning</p> <p>11 Management site, is there any need for any</p> <p>12 corrective action to make the property protective</p> <p>13 under RECAP?</p> <p>14 A. No, not to comply with the risk-based</p> <p>15 human health standards of RECAP.</p> <p>16 Q. Let's move, then, to groundwater.</p> <p>17 PANELIST OLIVIER: Can I ask a question,</p> <p>18 before we move to groundwater, on the soil?</p> <p>19 Would that be okay?</p> <p>20 JUDGE PERRAULT: Okay.</p> <p>21 PANELIST OLIVIER: I just wanted to ask,</p> <p>22 before we move on to groundwater, since we</p> <p>23 talked so much about the soil and SPLP</p> <p>24 leachability and so forth, and based -- you</p> <p>25 know, that's how y'all are showing protection</p>	Page 436	<p>1 with regard to chlorides? My mind was so</p> <p>2 much on barium.</p> <p>3 PANELIST OLIVIER: I understand.</p> <p>4 THE WITNESS: Yeah. Did I answer your</p> <p>5 question?</p> <p>6 PANELIST OLIVIER: Yeah, well, you had</p> <p>7 mentioned barium, so I just wanted to make</p> <p>8 sure that it was both targeted towards</p> <p>9 chloride and barium since we talked about</p> <p>10 SPLP for both of those constituents.</p> <p>11 THE WITNESS: Right. Yes, yes.</p> <p>12 PANELIST OLIVIER: Thank you.</p> <p>13 MS. RENFROE: All questions welcome.</p> <p>14 PANELIST OLIVIER: Thank you.</p> <p>15 MS. RENFROE: So unless there are any other</p> <p>16 questions, we'll move on to groundwater.</p> <p>17 BY MS. RENFROE:</p> <p>18 Q. And just a little headliner, I think</p> <p>19 we'll be able to move through this one a little</p> <p>20 more -- little more not rapidly but it will -- I</p> <p>21 don't think it will take quite as long.</p> <p>22 So can you tell the panel about where on</p> <p>23 the property you assessed groundwater under RECAP?</p> <p>24 A. Our focus for groundwater obviously is</p> <p>25 the admission areas, and this figure just shows a</p>

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1 good number of sampling locations we have within  
 2 the boundaries of what we've called the admission  
 3 areas. But because groundwater is a dynamic  
 4 medium, we are looking at the data that's  
 5 available outside of those admission areas to  
 6 understand delineation and natural quality and  
 7 things like that. So the full data set for the  
 8 property is part of the plan.  
 9 Q. Okay. And what steps did you take to  
 10 perform your evaluation of groundwater?  
 11 A. So I'm using both bodies of data, the  
 12 ICON and ERM data. I'm stepping from the  
 13 screening evaluation and moving into MO-1, using  
 14 the data for that shallow groundwater zone, so all  
 15 of the wells that were completed in that  
 16 20-to-60-foot interval.  
 17 Q. Now, moving, then, to the screening  
 18 step, we're showing on Slide 35 table 13 from your  
 19 report; correct?  
 20 A. Right.  
 21 Q. Can you explain to the panel what this  
 22 table is telling us?  
 23 A. Yes. So --  
 24 Q. And it's also one of the tables that is  
 25 in large format in the package we gave you,

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1 table 13.  
 2 A. So having looked at the similar soil  
 3 screening structure, this is structured the same  
 4 way. So maximum concentrations in the limited  
 5 admission areas in groundwater are shown in these  
 6 columns here. 2, 4, 5 and 6 are the areas where  
 7 groundwater was sampled, was characterized.  
 8 We see our total metals. We see the  
 9 dissolved metals. The screening standards that  
 10 I've posted on here are the RECAP screening  
 11 standards, that being the risk-based standards and  
 12 then also the EPA's secondary MCLs, the aesthetic  
 13 guidance for drinking water standards, which we  
 14 are using as a screening component here.  
 15 And then what's highlighted are the  
 16 concentrations for which max concentrations exceed  
 17 one of those screening standards, and that we are  
 18 identifying these as site-related COCs. So those  
 19 are the ones that are highlighted in blue. And I  
 20 make that distinction because we do have  
 21 background sampling data on this property that  
 22 shows that some of the constituents like iron and  
 23 manganese and chloride and sulfate are above that  
 24 secondary MCL. So those actually aren't  
 25 highlighted in blue here other than salt, which we

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1 know to be elevated; right, an E&P-related  
 2 constituent.  
 3 But the E&P-related constituents that  
 4 we're identifying are barium and strontium,  
 5 benzene, salt. Barium and benzene are  
 6 specifically found only within Area 2 and not  
 7 across the remainder of the property. It's  
 8 immediately adjacent to the blowout location.  
 9 Q. What did the groundwater data show about  
 10 the natural water quality of the shallow  
 11 groundwater zone?  
 12 A. Well, with these concentrations, these  
 13 constituents being elevated above the secondary  
 14 MCL, it's not a very desirable supply for drinking  
 15 water. That's what it tells us about that.  
 16 Q. Let me take us, then, to another set of  
 17 questions regarding your groundwater screening.  
 18 You mentioned something about Area 2. Is there  
 19 something unusual about Area 2 that you think is  
 20 important to explain to the panel?  
 21 A. There is. And I think Helen talked a  
 22 little about this. Specifically adjacent to the  
 23 blowout location, we see the highest  
 24 concentrations of chloride, and that's in  
 25 locations H-9 and 12, H-12 being the highest on

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1 the site, H-9 just a little bit lower. And at  
 2 those locations, we were talking about  
 3 concentrations that are 20,000 and 40,000 parts  
 4 per million chlorides, which means we have high  
 5 ionic strength in the water there. And that is  
 6 the location that barium remains in solution and  
 7 benzene is present above the screening standard.  
 8 Benzene is present above the screening standard in  
 9 9 and 12, barium in location 12 only.  
 10 And when we look at the chemistry of  
 11 those samples -- and Dave Angle's going to share  
 12 some graphics associated with this -- it is  
 13 similar to the signature of produced water. So  
 14 this suggests to us that it reflects water that  
 15 was released during the blowout.  
 16 Q. Now, it's been suggested that barium in  
 17 groundwater could be the result of migration of  
 18 barium from the surface soils down to the  
 19 groundwater. What is your conclusion about that?  
 20 A. Well, based on all the data that we  
 21 have, the body of data that we've been talking  
 22 about with regard to the barium distribution in  
 23 the soil and what we understand about this  
 24 particular location; that is, the unique high  
 25 ionic strength and the signature of the produced

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<p style="text-align: right;">Page 441</p> <p>1 water, this is the result of fluids that were  2 released and not a result of barium migrating from  3 the zero to 2-foot interval in soil. When we look  4 across the rest of the property, we don't see  5 barium elevated, we don't see benzene elevated.  6 Barium -- in our opinion, barium is not migrating  7 from the surface to the groundwater. That's not  8 what is causing this condition at H-9 and H-12.  9 Q. So after your screening step, did you  10 then carry barium and other constituents into your  11 management option analysis?  12 A. Yes.  13 Q. So let's talk about that.  14 So here we have Slide 37 in the  15 presentation. Tell the panel about the Management  16 Option-1 evaluation that you did for the  17 groundwater-to-air pathway.  18 A. Because benzene was detected in two  19 locations, I did include an analysis wherein we  20 are identifying the RECAP standards that are  21 protective of the groundwater in ambient air and  22 groundwater in enclosed structure air pathway.  23 Now, given the depth to groundwater here, this  24 isn't typically a concern and wouldn't even  25 necessarily be a scenario that we would be</p>	<p style="text-align: right;">Page 443</p> <p>1 surface water. How did you evaluate that?  2 A. Right. And, of course, this is a  3 required exercise under RECAP. As soon as we  4 recognize that groundwater is Class 3, this  5 becomes a focus, looking at the potential for  6 groundwater constituents to migrate to surface  7 water. And I've mentioned a couple of times  8 already that our geologic model -- and Dave Angle  9 is going to talk more about this, Purdom talked  10 about this some. Our geologic model says that's  11 simply not happening. There's not a hydraulic  12 connection between the water-bearing zone that is  13 at 30 feet across most of this property, shallower  14 in some areas but 30 feet across most of the  15 property, there's not a hydraulic connection to  16 water features on the property.  17 We did measure the depth of Bayou  18 Lacassine and looked at navigation materials to  19 identify that depth, which we found to be between  20 7 and 10 feet. Our measurement was 10 feet.  21 There's not a hydraulic connection, which means  22 that the constituents don't have the opportunity  23 to impact a receiving surface water body. The  24 pathway is incomplete.  25 Q. So Ms. Levert, then based on that</p>
<p style="text-align: right;">Page 442</p> <p>1 required to evaluate. Because when we have that  2 sort of material overlying the groundwater, the  3 migration of benzene is so limited and it  4 biodegrades so quickly in the soil column that  5 this wouldn't be a concern. I included this so  6 that you could see a comparison of the benzene  7 concentration in the groundwater to those RECAP  8 standards, and the concentration is below the  9 nonindustrial standard, so meaning a residential  10 scenario for outdoor air and indoor air.  11 Q. And this table 15, is this in your  12 report?  13 A. It is.  14 Q. And therefore, in the packet that each  15 of the panel members has.  16 So even if there were a --  17 hypothetically an enclosed structure that was  18 built directly over the area of maximum benzene  19 concentration in groundwater, based on what you  20 just said, would there be any significant risk  21 posed from that benzene concentration?  22 A. In my opinion, no.  23 Q. Let's move on, then, and talk about the  24 other potentially relevant exposure pathway for  25 Class 3 groundwater. And that is discharge to</p>	<p style="text-align: right;">Page 444</p> <p>1 analysis, what conclusions have you drawn about  2 whether there's any risk to surface water posed by  3 COCs in the groundwater?  4 A. The constituents aren't posing a threat  5 to receiving water bodies.  6 Q. And so under RECAP, could you have  7 stopped your analysis at that point?  8 A. Well, we could certainly simply conclude  9 the pathway is incomplete, no further evaluation  10 is needed. There is no risk associated with that  11 pathway. I did want to provide some context --  12 again, much like the SPLP chloride data -- some  13 context around the concentrations in groundwater,  14 so I did include a hypothetical calculation for  15 transport to a receiving water body.  16 If you go to the next slide, you'll see  17 that. Simply assuming Bayou Lacassine could be a  18 potential receptor. Bayou Lacassine is designated  19 as a nondrinking water body. It's not a drinking  20 water source. It's designated for recreation,  21 fish and wildlife propagation, so the protection  22 would be for those purposes. That means our  23 standard would be a GW 3 and DW standard.  24 And if you move forward to the next  25 slide, this is the development of the standard.</p>

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<p style="text-align: right;">Page 445</p> <p>1 It has a similar structure to the prior tables  2 where I'm showing the development, starting with  3 an initial Class 3 standard, multiplying by a  4 dilution attenuation factor that recognizes the  5 distance to the water body, thickness of the  6 water-bearing zone and our resulting final  7 standard.  8 The maximum concentrations are then  9 compared to that final standard. And again, just  10 providing context around what do these  11 concentrations in groundwater mean when we think  12 about potential for transport and discharge to  13 surface water?  14 And our conclusion is that the maximum  15 concentrations are below those example standards,  16 with one exception. And this is the location  17 immediately adjacent to the blowout. Chloride  18 concentrations in one of the two splits is above  19 that example standard. What does that mean?  20 Well, I have to think about: Does this tell me  21 that there is, in fact, a risk to a receiving  22 water body? And because there is not a hydraulic  23 connection, the answer is no, we haven't  24 identified a risk.  25 And this location, as you know, is</p>	<p style="text-align: right;">Page 447</p> <p>1 north in the down-gradient direction to confirm  2 declining concentration as you move down-gradient.  3 Q. So speaking of the chlorides in  4 groundwater, did you look at the delineation data  5 for chlorides in groundwater?  6 A. Yes. Yes. And so this figure is the  7 broad picture; right, where the yellow boxes are  8 highlighted where concentrations are below what we  9 consider to be representative of background, using  10 the background data sets at Area 1 and Area 9.  11 And in a broad sense, you can see we have a good  12 perimeter control for chlorides. But if we zoom  13 in on Area 2, which is where I'd like to go next,  14 and focus on H-12, H-9, H-12, here's our maximum  15 concentration. Studying the constituent  16 distribution around that, to the west, you can see  17 we are down within the background range very  18 quickly. To the north, order of magnitude decline  19 when we get to MW 4, so a pretty short attenuation  20 length is what we're observing here. We have  21 proposed an additional delineation point  22 down-gradient to the north for chlorides.  23 Q. So what conclusion have you drawn about  24 chlorides in groundwater based on your analysis  25 and this delineation data?</p>
<p style="text-align: right;">Page 446</p> <p>1 immediately adjacent to the ponded feature. The  2 sampling of that ponded water was important to us  3 because it demonstrated no connection there  4 either. This is not affecting that shallow pond  5 on the property where the chlorides were 23 parts  6 per million in the surface water.  7 But this did prompt us to look at the  8 distribution of chlorides around that point and  9 make sure that we have good delineation, that we  10 have an understanding of the extent of migration  11 of chloride laterally to confirm that there's not  12 a concern with transport to water bodies.  13 Q. So for all constituents other than  14 chlorides, based on this hypothetical analysis  15 that you did, even if there was connectivity  16 between groundwater and a surface water body,  17 would the concentrations of those constituents  18 that you evaluated pose any risk to any receiving  19 water body?  20 A. Well, the conclusion of this is no. And  21 the one constituent that we highlight -- again,  22 not a risk-based constituent -- with chloride, had  23 an exceedance of that hypothetical standard.  24 We're looking at the distribution of it closely.  25 We're proposing additional delineation to the</p>	<p style="text-align: right;">Page 448</p> <p>1 A. Yeah, so the first conclusion, of  2 course, is our observation that there's not a  3 hydraulic connection with surface water. That's  4 very important to us to begin with for  5 Class 3 groundwater. But with regard to  6 delineation, short attenuation length, good  7 control around those areas where concentrations  8 were elevated above a screening standard and  9 ultimately, that these concentrations do not pose  10 a threat to a receiving water body, which is our  11 RECAP requirement for Class 3 groundwater.  12 Q. Let's turn quickly to barium in  13 groundwater. What can you tell us about your  14 evaluation of the data and the delineation of  15 barium in groundwater?  16 A. So we talked a lot about the H-12  17 location, the unique conditions at H-12, with the  18 produced water signature of water chemistry  19 similar to produced water and the declining  20 concentration rapidly and representative of  21 background conditions across the property. And  22 despite the fact that we are aware that there are  23 barium concentrations above the screening in the  24 surface here.  25 Q. So is there any risk to a hypothetical</p>

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1 receiving water body based on any of the barium  
 2 concentrations?  
 3 A. No. And we did sample again -- I know  
 4 you can focus quickly on how close this is to the  
 5 blowout pond -- we did sample for barium there as  
 6 well. The concentrations are very low there,  
 7 .8 milligrams per liter in the surface water.  
 8 Q. While you're there at the screen, let's  
 9 talk about benzene in groundwater and the data for  
 10 that.  
 11 A. H-9, H-12 adjacent to the blowout are  
 12 the locations with benzene above the screening  
 13 standard, and the concentrations are not posing a  
 14 threat to a receiving surface water body. We did  
 15 analyze for hydrocarbons in the blowout. We did  
 16 not detect any hydrocarbon fractions or BTEX in  
 17 the surface water at the blowout pond.  
 18 Q. So with all of this in mind, can I now  
 19 ask you to summarize for the panel the results of  
 20 your RECAP groundwater assessment?  
 21 A. This is quicker than soil, so it's a  
 22 good thing.  
 23 The site-related constituents that we've  
 24 identified were in the shallow groundwater and  
 25 vertically delineated in the clay below the

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1 shallow water-bearing unit and above the Chicot  
 2 Aquifer. When we look at the Class 3 groundwater  
 3 pathway of groundwater to surface water, we don't  
 4 find a hydraulic connection. We don't see a  
 5 threat to surface water. There's no complete  
 6 pathway for direct exposure. It's not a viable  
 7 drinking water source. It is -- as Class 3, it's  
 8 not regulated as a drinking water supply or a  
 9 water supply, period. That shallow groundwater,  
 10 given our delineation and characterization of the  
 11 confining unit, is not a threat to the USDW.  
 12 Q. So have we now completed your tour  
 13 through your RECAP evaluation that you prepared in  
 14 support of Chevron's most feasible plan?  
 15 A. Yes.  
 16 Q. So having now completed that tour, if  
 17 you will, and explained your methodology and all  
 18 of your steps, I'd ask you now if you can  
 19 summarize for the panel your overall assessment  
 20 and conclusions based on that RECAP evaluation?  
 21 A. Sure. So just kind of stepping back up  
 22 in a quick overview, based upon the RECAP  
 23 analysis, the property is protective for its  
 24 ongoing uses, it's protective for a hypothetical  
 25 nonindustrial or residential land use. The

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1 groundwater that is affected at the site is  
 2 Class 3, there's no pathway,  
 3 groundwater-to-surface-water discharge, so we do  
 4 not see a threat to a receiving water body. Our  
 5 vertical characterization of the site suggests to  
 6 us that there is not a threat to the USDW, the  
 7 Chicot Aquifer beneath the site, and that  
 8 remediation of soil and groundwater aren't  
 9 necessary to comply with the risk-based health  
 10 protective standards of RECAP.  
 11 Q. I didn't mean to cut you off. Any other  
 12 conclusion that you wanted to advise the panel?  
 13 Or do you think you've covered it all?  
 14 A. I think that's it.  
 15 Q. So to wrap it all up, based on your  
 16 RECAP evaluation performed under and in accordance  
 17 with RECAP, you see no need for remediation of the  
 18 property to protect human health at the site; is  
 19 that correct?  
 20 A. That's correct.  
 21 MS. RENFROE: Thank you, Ms. Levert. Those  
 22 are all my questions.  
 23 THE WITNESS: Thank you.  
 24 MR. CARMOUCHE: Restroom?  
 25 JUDGE PERRAULT: We're going to have a

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1 ten-minute break, and we'll be back at 2:45.  
 2 (Recess taken at 2:35 p.m. Back on record  
 3 at 2:45 p.m.)  
 4 JUDGE PERRAULT: Back on the record.  
 5 Counsel, please resume your  
 6 cross-examination.  
 7 CROSS-EXAMINATION  
 8 BY MR. CARMOUCHE:  
 9 Q. Good afternoon, panel, Ms. Levert.  
 10 A. Good afternoon.  
 11 Q. I want to pick up where I left off, but  
 12 first I want to talk about, I allowed you to say  
 13 things about issues that I want to make sure this  
 14 panel understands what you're not an expert in.  
 15 A. Okay.  
 16 Q. You're not a hydrogeologist, are you?  
 17 A. I am not.  
 18 Q. You're not a hydrologist?  
 19 A. That's correct.  
 20 Q. You're not an expert in fate and  
 21 transport of chemicals? You rely upon the RECAP  
 22 analysis to do that; correct? You don't do any  
 23 type of modeling to determine fate and transport  
 24 of chemicals?  
 25 A. Correct. I do rely on our

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<p style="text-align: right;">Page 453</p> <p>1 hydrogeologists for that. We do have a team who  2 do more than just the simple lookups, so we do  3 have that.  4 Q. And I'm going to get to that. A lot of  5 things you said were -- were this subject matter.  6 And I'm going to get to...  7 A. Okay.  8 Q. You're not an expert in classifying an  9 aquifer?  10 A. Correct. I am relying on others.  11 Q. You're not an expert in determining if  12 an aquifer is hydraulically connected to another  13 aquifer?  14 A. I'm relying on others for that  15 information.  16 Q. So all the information you said about  17 classification of aquifer, transportation of  18 chemicals, and all the hydrology information,  19 you're relying upon Mr. Angle; correct?  20 A. I am relying on him for those  21 conclusions.  22 Now, just to let you know what my role  23 is, too, as a RECAP practitioner, I do participate  24 in gathering the information and reviewing the  25 information when it comes to aquifer</p>	<p style="text-align: right;">Page 455</p> <p>1 A. There would be additional analysis  2 required.  3 Q. Thank you. Okay.  4 Let's go back to when I was stopped.  5 You said you comment and are involved in  6 a process of developing RECAP.  7 A. That I provided comments on the drafting  8 and the re-promulgations over time.  9 Q. Okay. So you commented on the 2003  10 version?  11 A. Yes.  12 Q. You commented on the 2016 version?  13 A. I believe I did, yes.  14 Q. You commented on the 2019 version?  15 A. Yes.  16 Q. Okay. So did you comment on sections or  17 information in those versions and your comments  18 were not accepted and changes were not made?  19 Do you know?  20 A. I don't know. I don't remember.  21 Because it's a dialogue. The comment process is a  22 dialogue. And I'm sorry, I just don't remember.  23 And as you know, 2019 -- actually both  24 the '16 draft and the 2019 draft never became a  25 final regulation, so those still remain in draft</p>
<p style="text-align: right;">Page 454</p> <p>1 classification; for example, the water well  2 survey. I do look at the characterization  3 information, the components of a classification  4 with that team. So I'm not entirely divorced from  5 that evaluation. So it is not something that is  6 black-boxed and then comes to me. I am a part of  7 that dialogue and support the evaluation from  8 various aspects other than, for example, slug  9 testing. That -- I'm not a slug-test expert.  10 Q. Correct. So my point being is, if the  11 panel believes that Mr. Angle is wrong, the  12 information you just testified to is not correct  13 as well; fair?  14 A. Well, if -- if -- are you saying if the  15 classification is incorrect? Is that what you're  16 asking?  17 Q. If the fate and transports of chemicals,  18 this panel doesn't believe Mr. Angle that these  19 chemicals are not transferred into groundwater,  20 they don't believe Mr. Angle in the  21 classification, they believe it's a 2, a drinking  22 water aquifer, all the things that you relied upon  23 and talked about today, if he's wrong in some of  24 the things you talked about, then your information  25 is incorrect as well?</p>	<p style="text-align: right;">Page 456</p> <p>1 today.  2 Q. Right. But you're -- how long has this  3 been? It's 2016. You've been commenting, there  4 have been scientists; right? All of these  5 scientists have gotten together and created a  6 draft because they thought, what, maybe there was  7 some errors or some changes that needed to be made  8 in the 2003 version? Is that why?  9 A. Well, there were some updates that were  10 being contemplated.  11 Q. They learned over the process; right?  12 You learn things in science, so you make changes?  13 A. Yes.  14 Q. You also -- in opening statement, there  15 was a very strong indication about asking this  16 panel and Office Of Conservation to be consistent.  17 Do you remember that? Were you here for that?  18 A. I did listen in.  19 Q. And I think today, you talked about some  20 cases and history that you've had in front of this  21 panel and also asked this panel to be consistent;  22 correct?  23 A. Well, I indicated that some of the  24 methods that we're applying here are based upon  25 our understanding of how DNR has required that</p>

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1 certain investigations be conducted in the past.  
 2 I've relied on that.  
 3 Q. You testified to this panel that what  
 4 you're proposing today is consistent with what you  
 5 proposed in the past and was accepted?  
 6 A. Certain elements are, yes. They  
 7 informed my analysis.  
 8 Q. So let's talk about in Savoie, you were  
 9 involved; correct?  
 10 A. Yes.  
 11 Q. That's a piece of land in Cameron Parish  
 12 on the coast; is that correct?  
 13 A. It's on a chenier.  
 14 Q. And you advised DNR that nothing needed  
 15 to be done; isn't that true?  
 16 A. My evaluation was that the  
 17 concentrations in soil and groundwater didn't pose  
 18 a risk to human health and that there wasn't an  
 19 action required to be protective of human health.  
 20 Q. And DNR required a remediation, even  
 21 though you opined that nothing needed to be done;  
 22 correct?  
 23 A. Well, the responsible party proposed a  
 24 remediation and DNR accepted it.  
 25 Q. The responsible party said nothing

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1 needed to be done to the shallow groundwater of  
 2 chlorides along the coast of Louisiana; isn't that  
 3 true? That's what Shell said; correct?  
 4 A. The MFP ultimately proposed a  
 5 remediation of groundwater.  
 6 Q. So you -- you opined first that nothing  
 7 needed to be done to groundwater and then the MFP  
 8 that came from the panel said you had to restore  
 9 chlorides in the shallow groundwater to  
 10 background? Isn't that true?  
 11 A. You might take a look at the review of  
 12 this particular case. I concluded that there was  
 13 not a risk to human health and that remediation of  
 14 groundwater wasn't required for that purpose.  
 15 Shell elected to propose a remediation to  
 16 background for chlorides and the DNR accepted that  
 17 proposal.  
 18 Q. So they restored chlorides to  
 19 background, even though there wasn't a human  
 20 health risk?  
 21 A. No. They didn't restore chlorides to  
 22 background, because as you know, that project has  
 23 proceeded and there have been field tests to  
 24 evaluate, reevaluate the classification of that  
 25 aquifer. It has been determined to be Class 3,

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1 and the final decision is that there will not be a  
 2 remediation to background for chlorides in that  
 3 zone.  
 4 Q. They could go look it up. We'll agree  
 5 to disagree.  
 6 A. Yeah.  
 7 Q. There were millions of dollars spent on  
 8 remediation but for your opinion that nothing  
 9 needed to be done; correct?  
 10 A. Again, I concluded there was no human  
 11 health risk.  
 12 Q. Vermilion Parish School Board, you  
 13 opined nothing needed to be done; correct?  
 14 A. That's not correct.  
 15 Q. Okay. There was a small area, I think  
 16 of benzene, that you said needed to be remediated  
 17 in a small piece of a pit; is that correct?  
 18 A. There were two locations in soil and  
 19 sediment. One was a pit. One was an area where  
 20 there were active industrial operations going on  
 21 and the other was benzene in groundwater.  
 22 Q. Total remediation that you and Chevron  
 23 gave this panel was, I think, \$3 million?  
 24 A. No, I can't tell you that.  
 25 Q. They can look. They can go back and

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1 look, if you don't remember.  
 2 A. I can't tell you that because I'm not  
 3 the remediation expert. So I can't even tell you  
 4 that number.  
 5 Q. Do you know if they've spent over  
 6 \$10 million on sediment and pit remediation to  
 7 date?  
 8 A. I know they've completed sediment and  
 9 pit remediation to date. The sediment remediation  
 10 had nothing to do with human health objectives,  
 11 and the remediation that I recommended in terms of  
 12 the pit area has been completed.  
 13 Q. Do you know how many pits were  
 14 remediated in Raymond Thomas and how many millions  
 15 of dollars was spent in Raymond Thomas on pits and  
 16 then you say that nothing needed to be done  
 17 because it was not a human health risk?  
 18 A. I don't think I was involved in that  
 19 one.  
 20 Q. James Field?  
 21 A. No, I didn't work on that.  
 22 Q. Wasn't involve in it?  
 23 A. No.  
 24 Q. No? Guidry?  
 25 A. I don't remember that one.

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1 Q. Okay.

2 A. If I was, I don't remember the project.

3 Q. I think I've made my point, is that --

4 to this panel is that even though there's not a

5 human health risk, doesn't mean that a remediation

6 doesn't need to be performed? You would agree

7 with that?

8 A. Sometimes there were other drivers. I

9 agree with that.

10 Q. Thank you.

11 And I'm going to go through your

12 PowerPoint so we can get it out the way and then

13 get more detail.

14 On page 4, you said something about no

15 threat to Chicot Aquifer. Is that another

16 expert's opinion or is that -- did you do the

17 analysis to determine if there was some fate and

18 transport or migration to the Chicot Aquifer?

19 A. Well, it was actually an effort of the

20 team that included the vertical delineation. It's

21 a multiple-lines-of-evidence demonstration.

22 Q. Let me ask -- I think we can move on,

23 but I want to make sure.

24 So I think Mr. Delmar at the start of

25 this, asked -- I can't remember the first

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1 witness -- about H-10. You didn't look at the

2 head and the potentiometric surface drop in that

3 area to determine if that feature could be caused

4 by migration to the Chicot Aquifer?

5 A. I didn't look at that topic. Mr. David

6 Angle looked at that topic. I looked at the

7 multiple lines of evidence as part of my

8 conclusion.

9 Q. Okay. You also talked about the current

10 use of the property and what the property can be

11 used for. Is there anything in RECAP that says

12 the responsible party or their experts get to

13 choose what somebody in Louisiana can use their

14 property for?

15 MS. RENFROE: Your Honor, I'll object to the

16 extent that question is asking her to make a

17 legal conclusion. If he can rephrase it to

18 her understanding.

19 JUDGE PERRAULT: Rephrase it so it's not a

20 legal --

21 MR. CARMOUCHE: I'm asking -- she's a

22 scientist.

23 BY MR. CARMOUCHE:

24 Q. I'm asking, anything in this book that

25 she relies upon, does it say anything in here that

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1 the responsible party or their experts in RECAP

2 get to choose what the future use of the

3 property's going to be?

4 A. RECAP doesn't -- it's not a legal

5 document and it doesn't have the purpose of

6 negotiation between parties or being a part of a

7 private dispute. Instead, it is a technical

8 guidance that requires that we look at reasonable

9 maximum exposure, that we look at reasonably

10 anticipated land uses. This is a technical

11 guidance to allow us to make reasonable

12 assumptions within guidance regarding land uses.

13 It has nothing to do with private property

14 disputes.

15 BY MR. CARMOUCHE:

16 Q. Do you think it was reasonable 10 to 15

17 years ago to think that the swamp in Lake Charles,

18 they were going to build a billions of dollars of

19 casino in that swamp and bring in tons of dirt?

20 Was that reasonable 15 years ago?

21 A. Well, I can't tell you that. Perhaps it

22 was contemplated. Maybe it was contemplated

23 longer than that. I can't tell you that,

24 Mr. Carmouche.

25 Q. Was it reasonable to think 15 years ago

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1 that outside Lafayette, it would explode, and now

2 everybody's moving there? Was that reasonable?

3 Wasn't that crops?

4 A. It may or may not be. To the extent

5 that that applies to this property, I think you're

6 aware that I evaluated this using a nonindustrial

7 land use.

8 Q. We're going to get there.

9 And did you -- Ms. Connelly talked about

10 the groundwater and that there was no exposure, so

11 I want to kind of tie that in to the health part.

12 Okay?

13 A. (Nods head.)

14 Q. And I don't think it was asked to

15 Ms. Connelly, but if -- if --

16 Because you consider, you know

17 Mr. Henning has cattle on his land, do you not?

18 A. Yes.

19 Q. Okay. So if he drills a well in that

20 shallow zone to put in a cow trough, okay, in some

21 of those areas where there's barium, okay, did

22 you -- and the animals eat it, assuming it's toxic

23 barium -- I'm going to ask you to assume this --

24 did you look at the pathways to humans if they

25 would eat the cattle or if the water flows over

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1 and the rabbits eat the water, that she talked  
 2 about that would die immediately? Is that a  
 3 pathway you considered?  
 4 A. I -- number one, there isn't a well.  
 5 That's not a current scenario. With regard to  
 6 barium, the kinds of concentrations that we see,  
 7 even at the location of the blowout with the  
 8 barium concentration of 2 parts per million, that  
 9 would not be a concern for uptake into cattle.  
 10 Just based on the -- from the perspective of a  
 11 constituent concern and potential uptake, it  
 12 doesn't warrant that kind of calculation.  
 13 Q. You're not an ecologist; that's what  
 14 Ms. Connelly testified to? Are you relying upon  
 15 her or did you look at if a cattle trough was  
 16 filled with water, you looked at and determined  
 17 that an animal's not going to get sick?  
 18 A. I have worked very closely with her and  
 19 looking at --  
 20 Q. She said she is the --  
 21 MS. RENFROE: Excuse me, sorry.  
 22 Mr. Carmouche --  
 23 MR. CARMOUCHE: I'm sorry.  
 24 MS. RENFROE: -- kindly let her answer the  
 25 question.

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1 THE WITNESS: Thank you.  
 2 A. I've worked closely with her, studying  
 3 uptake factors with a number of constituents,  
 4 barium being one of them. And whether we're  
 5 talking about uptake into beef or we're talking  
 6 about uptake into wild game, that was part of our  
 7 discussion as part of our site conceptual modeling  
 8 early on, to determine that that didn't warrant a  
 9 quantitative evaluation. And that is even  
 10 assuming that one were to have access to that  
 11 water, specifically with regard to barium. So  
 12 yes, this is something that we, as a team,  
 13 discussed because it has multiple applications;  
 14 that is, uptake into ecological receptors, uptake  
 15 into species that could be consumed, like wild  
 16 game or, in this case, cattle.  
 17 BY MR. CARMOUCHE:  
 18 Q. I'm not going to argue with -- the panel  
 19 heard, but maybe I heard something different. I  
 20 thought she said she didn't consider that because  
 21 there was no way the water could get to the  
 22 surface because a pond wouldn't go 25 feet deep.  
 23 A. I'm talking about --  
 24 Right. I'm talking about whether we're  
 25 talking -- I'm talking about water in a pond,

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1 water that is groundwater. This is an ongoing  
 2 study that we, as a team, have had with regard to  
 3 the potential uptake into species, whether they're  
 4 ecological species or game for consumption.  
 5 Q. I thought she said that if that was  
 6 toxic barite, an animal ate it, they would die  
 7 immediately.  
 8 MS. RENFROE: Object.  
 9 BY MR. CARMOUCHE:  
 10 Q. I'll move on. I'll move on.  
 11 And on page 39 of your slide show, you  
 12 have a potentiometric map. And you talk about  
 13 with regards to groundwater flow that you looked  
 14 at. Do you remember talking about that?  
 15 A. Yes.  
 16 Q. Did you watch -- I don't think you were  
 17 here during Mr. Purdom's testimony?  
 18 A. Yes.  
 19 Q. You heard him say that this groundwater  
 20 is not even in an aquifer; correct?  
 21 A. Well, he -- that was his opinion, that's  
 22 right. He was talking about this specifically  
 23 being stringers, that's right.  
 24 Q. So you disagree with him, you think it's  
 25 an aquifer?

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1 A. Well, from the perspective of RECAP,  
 2 that term doesn't affect our evaluation, our RECAP  
 3 evaluation. In RECAP, groundwater, anything that  
 4 is identified as a permeable groundwater zone is  
 5 subject to RECAP evaluation. We then move into  
 6 classification: Is it Class 3? Class 2?  
 7 Class 1? So to call it an aquifer or not isn't  
 8 particularly meaningful for me in my RECAP  
 9 evaluation.  
 10 Q. But the flow of water is. You had that  
 11 in your title. That was important to you, to put  
 12 the groundwater flow?  
 13 A. Well, that is specifically pointing out  
 14 the flow direction to the north/northeast in this  
 15 shallow groundwater-bearing zone, and it aided me  
 16 in making an assumption about what would be a  
 17 hypothetical receptor point in the down-gradient  
 18 direction.  
 19 Q. If it's a shallow groundwater and not an  
 20 aquifer, how can it flow if it's just stringers  
 21 that stop? How are you going to have flow?  
 22 A. Mr. Carmouche, I'm not expressing an  
 23 opinion about that. I've made an assumption that  
 24 it can.  
 25 Q. All right. Okay. You would agree that

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<p>1 the soil is contaminated and cannot be used for  2 its intended purposes; correct?  3 A. No, I don't agree with that --  4 Q. You would agree --  5 A. From the perspective of my RECAP  6 analysis, the usability of the soil has no  7 limitation.  8 Q. You would agree that the groundwater is  9 contaminated and unsuitable for its intended  10 purpose; correct?  11 A. Again, from the perspective of my  12 health-based evaluation in the context of RECAP,  13 the groundwater is Class 3 and is not unsuitable  14 for its intended purposes, considering that  15 classification.  16 Q. How long have you been working for  17 Chevron?  18 A. I've worked on various projects for them  19 throughout my career.  20 Q. And you understand that Chevron, the  21 reason we're here is because they admitted  22 liability and that there's environmental damage in  23 the areas of concern; correct?  24 MS. RENFROE: Object to the  25 mischaracterization of what Chevron admitted.</p>	<p>1 A. Yes.  2 Q. And that was sent to a federal judge in  3 Lake Charles; correct?  4 A. Yes, that's my understanding.  5 Q. You were in the discussions with Chevron  6 to decide if they should make that admission?  7 A. No, not to decide whether they would  8 make that admission. That's a legal -- well, it's  9 a whole legal thing.  10 Q. Let me ask it a different way.  11 MS. RENFROE: Let her finish her answer.  12 A. It's a whole legal thing.  13 JUDGE PERRAULT: If Counsel has an objection,  14 just pose it to me.  15 MS. RENFROE: I will, Your Honor. Pardon me.  16 JUDGE PERRAULT: That's okay.  17 A. The involvement that we had was to  18 provide the map that put the boxes in all the  19 areas. It's based upon our comparison to 29-B  20 standards and RECAP screening standards to say  21 that these are the areas where we understand there  22 are to be concentrations that require further  23 evaluation.  24 MR. CARMOUCHE: Scott, go to 3029-I.  25 Next one.</p>
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<p>1 MR. CARMOUCHE: Let's read it. I'm sorry. I  2 don't want to put words in your mouth.  3 Can you go to C-1, Scott?  4 BY MR. CARMOUCHE:  5 Q. Have you seen this before?  6 A. Yes.  7 Q. That's Chevron's admission; correct?  8 A. Yes.  9 Q. Scott, go to C-3.  10 Seven, "You understand that Chevron  11 admits that environmental damage, as defined by  12 312, exists in soil and discontinuing shallow  13 water-bearing zone on plaintiff's property within  14 Areas 2, 4, 5, outlined in Exhibit A"; correct?  15 A. Yes.  16 Q. You're aware of that?  17 A. Yes.  18 Q. Eight, "Chevron also admits that  19 environmental damage, as defined by Act 312,  20 exists in the soil on plaintiffs' property within  21 Areas 6 and 8, outlined in A"; correct? It's in  22 there.  23 A. Yes.  24 Q. Go to the signature page. And it was  25 signed by a lawyer for Chevron; correct?</p>	<p>1 BY MR. CARMOUCHE:  2 Q. And it's actually in their admission  3 also where they cite these definitions. You're  4 aware of these definitions; correct?  5 A. Yes. I have seen these definitions.  6 Q. Okay. And you agree that "Environmental  7 damage shall mean any actual or potential impact,  8 damage or injury to environmental media caused by  9 contamination"; correct?  10 A. That's what it says.  11 Q. And then contamination says: "Shall  12 mean the introduction or presence of substances or  13 contaminants into a usable groundwater aquifer, an  14 underground source of drinking water or soil in  15 such quantities as to render them unsuitable for  16 their reasonably intended purposes"; correct?  17 A. Correct.  18 Q. So environmental damage has  19 contamination in it, you have to have  20 contamination; correct?  21 MS. RENFROE: Again, I'll renew my objection.  22 To the extent these questions are calling for  23 a legal conclusion from a nonlegal witness, I  24 object.  25 JUDGE PERRAULT: All right. I think you're</p>

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1 asking for legal conclusions. She's telling  
 2 you what she found.  
 3 MR. CARMOUCHE: I'm not. These scientists,  
 4 Your Honor, have to -- this is in what they  
 5 have to develop the plan under, 3029. That's  
 6 in Chapter 6. I'm not asking her -- I think  
 7 she was just protecting herself, and I don't  
 8 want to speak for her. I'm not asking her a  
 9 legal opinion. I'm asking her a science  
 10 opinion. This is science. This is  
 11 environmental damage and contamination.  
 12 JUDGE PERRAULT: All right. Steer your  
 13 question to the science of it, rather than to  
 14 the legal effects of it.  
 15 MR. CARMOUCHE: Okay.  
 16 BY MR. CARMOUCHE:  
 17 Q. So you've looked at these definitions  
 18 before; correct?  
 19 A. I've seen these definitions.  
 20 Q. And so Chevron, in this case, has  
 21 admitted there's environmental damage in those  
 22 areas that we talked about; correct?  
 23 A. My understanding of that legal document  
 24 is this: That they admitted that there is actual  
 25 or potential impact. And I was asked, as a

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1 scientist, to take the information, to gather the  
 2 information, and provide an opinion about whether  
 3 or not that actual or potential impact poses a  
 4 risk under the regulatory framework RECAP and,  
 5 therefore, what would be the appropriate action in  
 6 a most feasible plan to address it. That's my  
 7 understanding of what Chevron's admission was.  
 8 Q. So let me ask you a scientific question.  
 9 You do not believe in all of the areas  
 10 we talked about that introduction or presence of  
 11 substances or contaminants into a usable  
 12 groundwater aquifer, an underground drinking  
 13 water -- drinking water or soil is there in such  
 14 quantities as to render those areas unsuitable for  
 15 their reasonable intended purpose?  
 16 A. Well, my review of that question is  
 17 through the lens of RECAP, through the regulatory  
 18 framework of RECAP. And from the RECAP  
 19 perspective, no, there is not a limitation, there  
 20 is not an impact that renders a Class 3  
 21 groundwater or the USDW unsuited for its intended  
 22 purpose.  
 23 Q. And you told Chevron that --  
 24 A. Well, I gave --  
 25 Q. -- prior to May of --

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1 A. I gave them the conclusions of my RECAP  
 2 evaluation.  
 3 Q. Prior to May of 2022? Because your  
 4 report was issued prior to May of 2022.  
 5 A. Well, my expert report, you're talking  
 6 about.  
 7 Q. That's right.  
 8 A. My expert report, it was, yes. Yes.  
 9 And that's correct. I provided my RECAP  
 10 evaluations from a human health perspective to  
 11 Chevron, yes.  
 12 Q. Okay. And taking your opinion, you are  
 13 aware that they sent this to a judge, federal  
 14 judge, on May 27th, 2022?  
 15 A. Yes. And as I said, my understanding of  
 16 that is: Their admission is there is actual or  
 17 potential impact, and we agreed to address it and  
 18 to use the regulatory tools that we have to  
 19 determine what is required to address it. And  
 20 that's what our plan is about.  
 21 Q. Have you discussed with Chevron his  
 22 ruling as to what you just talked about? Because  
 23 you talked about the legal document. So I want to  
 24 bring it up. You read his ruling?  
 25 A. I'm aware of it. I'm aware of it. And

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1 I cannot make a legal interpretation of that  
 2 ruling.  
 3 Q. I understand. But you would agree that  
 4 I read those two definitions correctly and the  
 5 panel can --  
 6 A. Yes.  
 7 Q. -- take it as it is?  
 8 A. Yes.  
 9 Q. All right. Let's move on.  
 10 When you were on Slide 16 -- I want to  
 11 go to wet weight/dry weight. Okay?  
 12 When you were on Slide 16, I think -- I  
 13 thought I heard Ms. Renfroe say that go to  
 14 RECAP -- it says: "RECAP says that you shall  
 15 evaluate soil in wet weight," and she said,  
 16 2.8.2.1. Do you remember her saying that?  
 17 A. I don't recall exactly what she said,  
 18 but I know what you're talking about. I know the  
 19 section you're talking about, yeah.  
 20 Q. Are you aware if that section says  
 21 "shall"?  
 22 A. Let's look at that section.  
 23 Q. Go ahead. 2.8.2.1.  
 24 A. Yeah.  
 25 Q. (Reviews document.)

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1 A. So here's what that section says. And  
 2 this is the critical part that advises us, as  
 3 practitioners under RECAP, to perform our exposure  
 4 concentration or direct contact evaluation in wet  
 5 weight. It says: "Typically exposure  
 6 concentrations and the risk-based SS and RS are  
 7 based on a wet-weight concentration, whereas  
 8 concentrations in environmental fate and transport  
 9 RS are based on dry weight."  
 10 And working with the DEQ around this  
 11 topic over many, many years, they have clarified  
 12 that what that means is direct contact, they  
 13 expect an evaluation in wet weight. And for  
 14 groundwater protection if the soil is particularly  
 15 wet, like sediment, then their expectation is you  
 16 would perform the conversion to dry weight.  
 17 That's why it says: "It's not necessary to adjust  
 18 the reporting constituent concentrations prior to  
 19 calculation of the AOIC for comparison with the  
 20 environmental fate and transport SS if you don't  
 21 have a significant moisture content."  
 22 All that said, EPA does provide a  
 23 different guidance, and Dr. John Kind talked about  
 24 this. And EPA's guidance says you will use dry  
 25 weight for the direct contact evaluation. So

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1 there's a difference in those two guidances. I'm  
 2 well-aware of that and have been for a long time.  
 3 And in every one of these projects, expert report,  
 4 these kinds of evaluations, we're including both  
 5 wet and dry weight to provide that full body of  
 6 information.  
 7 And on this site, as on many sites where  
 8 we're not talking about significant moisture  
 9 content, it just doesn't make a difference. The  
 10 conclusions remain the same. The dry weight  
 11 evaluation that I did is in Appendix M. You're  
 12 aware of the dry weight evaluation I did in my  
 13 expert report. Dr. John Kind's evaluation was in  
 14 dry weight in Appendix T, I think.  
 15 Q. My question was simply the word "shall"  
 16 doesn't appear in RECAP 2.8, whatever that  
 17 section is?  
 18 A. No.  
 19 Q. Okay. So let's talk about 2016. I know  
 20 it's not promulgated, but a lot of work went into  
 21 that, you commented.  
 22 MR. CARMOUCHE: So let's -- can you go to the  
 23 next slide, Scott?  
 24 BY MR. CARMOUCHE:  
 25 Q. Did you comment -- I'm going to show you

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1 the RECAP 2016 2.2.4.  
 2 Did you read this section of RECAP, the  
 3 proposed RECAP draft in 2016?  
 4 A. I'm sure I did.  
 5 Q. Okay. So let's read that section that's  
 6 highlighted.  
 7 MS. RENFROE: Objection, your Honor. This is  
 8 not an exhibit on Plaintiff's exhibit list.  
 9 MR. CARMOUCHE: This is cross-examination.  
 10 JUDGE PERRAULT: He's cross-examining her on  
 11 her testimony.  
 12 MR. CARMOUCHE: I'm not introducing this into  
 13 evidence. This is cross-examination. I'm  
 14 allowed to do this.  
 15 JUDGE PERRAULT: I'm going to allow it. Go  
 16 ahead.  
 17 MS. RENFROE: My objection is noted, Your  
 18 Honor?  
 19 JUDGE PERRAULT: Yes.  
 20 MS. RENFROE: Thank you.  
 21 BY MR. CARMOUCHE:  
 22 Q. "The data shall be presented in units of  
 23 milligram per kilogram (soil, sediment, and biota)  
 24 milligrams per liter or (air). Soil and sediment  
 25 shall be reported on a dry-weight basis unless

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1 otherwise approved by the department to address  
 2 site-specific concerns." Did I read that  
 3 correctly?  
 4 A. Yes.  
 5 Q. The word "shall" is in the 2016 version.  
 6 A. Right. It's modified to be consistent  
 7 with the EPA in the new draft.  
 8 Q. So the 2016 version, after looking at  
 9 all the data since 2003, actually says you shall  
 10 report in dry weight. You agree?  
 11 A. I agree that's right. That will be a  
 12 change eventually.  
 13 Q. So I'm assuming you commented and said  
 14 that was wrong and after your comments they still  
 15 did not decide to take it out?  
 16 A. I didn't -- I don't know that I  
 17 commented and said it was wrong.  
 18 Q. But you disagree with that; right?  
 19 A. No, I didn't say I disagreed with that.  
 20 Q. You don't feel that soil and sediment  
 21 shall be reported on a dry-weight basis?  
 22 A. I said I don't disagree with that. It  
 23 can be reported on either basis. The point is,  
 24 what are you going to use in your RECAP  
 25 evaluation? And I've provided both.

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<p>1 Q. 2019, let me show you 2019. 2.3.5. It  2 says: "Soil and sediment shall be reported on a  3 dry-weight basis unless otherwise approved by the  4 Department to address site-specific concerns.  5 Tissue concentrations shall be represented in  6 units milligram per kilogram on a wet-weight basis  7 unless otherwise approved." Do you see that?  8 A. Yes.  9 Q. So they are now requiring dry weight for  10 soil and sediment, soil and sediment, and the only  11 wet weight that they're saying shall be used is  12 for tissue concentration. Is that correct?  13 A. Well, they haven't moved to these  14 requirements yet. We're still working with the  15 old document. However, when we collect our data,  16 we ask the lab to provide moisture contents so  17 that we can do it both ways. So I think you're  18 making an issue out of something that's not an  19 issue here.  20 Q. And I think you recognize, so I don't  21 have to show you, you know that the EPA screening  22 levels, frequently asked questions, they say use  23 dry weight?  24 A. Yes.  25 Q. Thank you.</p>	<p>1 industries are part of this organization; correct?  2 A. Well, it includes academia, it includes  3 all kinds of people. And, to use your term, "tree  4 huggers" may be involved.  5 Q. Some people say if this is some  6 environmental group puts this out, we probably  7 shouldn't listen to it. I just want to recognize  8 that this is a -- your company is part of this  9 organization?  10 A. Yes.  11 MR. CARMOUCHE: Scott, can you show the  12 slide?  13 BY MR. CARMOUCHE:  14 Q. And on soil background and risk  15 assessment, Chevron was part of this document;  16 correct? You see their symbol on the front?  17 A. Yes.  18 Q. Did you send your report or most  19 feasible plan to Chevron to review to make sure  20 that their scientists agreed with your opinion?  21 A. They have reviewed my report. I think  22 you and I talked about that in deposition, if you  23 recall.  24 Q. So Chevron's scientists agreed with your  25 opinion that you should use wet weight rather than</p>
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<p>1 A. That's EPA protocol.  2 Q. And also, the EPA exposure factor  3 handbook, they also say use dry weight?  4 A. That's correct, based upon the ingestion  5 and the dermal equations there.  6 Q. Are you aware of the Interstate  7 Technology Regulatory Council?  8 A. Yes.  9 Q. Are you a member?  10 A. A member --  11 Q. Is ERM?  12 A. ERM is a member.  13 Q. ERM is a member.  14 What is that?  15 A. Well, it's an organization that focuses  16 on technical issues and the development and  17 fleshing out of common needs for evaluation and  18 remediation. It prepares guidance documents.  19 It's not a regulation, and it includes  20 participation of people from industry and  21 academia. It is an independent, if you will,  22 science organization.  23 Q. So it's not like a bunch of tree  24 huggers. This is an organization that ERM's  25 involved in, Chevron, BP, Shell, all these</p>	<p>1 dry weight? Do you know that for a fact or are  2 you just saying they reviewed your report?  3 A. Mr. Carmouche, my report doesn't say the  4 only basis for my conclusions are wet weight. My  5 reports says: Here's the evaluation in wet weight  6 because that's what it says right here on page 46  7 of the current RECAP document. My report then  8 says: "We've also evaluated this in dry weight  9 and it makes no change to the conclusions."  10 Q. You talked about to this panel and said  11 ICON brings it to a lab and they grind that stuff,  12 it's like stones, where they grind and then they  13 run it through the processing; correct? Do you  14 remember describing that to the panel?  15 A. They used a dry-and-grind process to  16 prep their samples.  17 Q. You talked about how bad that was?  18 A. No. That's a mischaracterization of  19 what I said.  20 Q. I say "bad."  21 I mean your opinion -- correct me if I'm  22 wrong -- is that the way Chevron did it to  23 determine wet weight is a lot better than ICON's  24 way of performing it and relying upon ICON's data  25 of dry weight?</p>

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1 A. No, that's a misinterpretation.  
 2 Q. So you would agree that a risk  
 3 assessment should be performed using all of the  
 4 dry weight, not wet weight? You agree with that?  
 5 A. I agree that EPA's guidance is evaluate  
 6 in dry weight because algorithms for ingestion and  
 7 dermal are based upon experiments that were  
 8 performed and research that is provided in dry  
 9 weight. There are certain situations where wet  
 10 weight is appropriate as well. The DEQ's RECAP  
 11 guidance specifically says wet weight, and they  
 12 have provided their reasons for that in the past.  
 13 They've provided their reasons for that.  
 14 As they move forward, their document  
 15 will become consistent with the EPA guidance. I'm  
 16 aware of that and, for that reason, provided the  
 17 analysis in both wet weight units and dry weight  
 18 units, and the conclusion remains the same.  
 19 Q. Let's go to the next page.  
 20 And to the analysis you did -- at least  
 21 in your report -- maybe it's changed, or in your  
 22 most feasible plan, you converted wet weight to  
 23 dry weight?  
 24 A. I did make a conversion between wet and  
 25 dry.

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1 Q. And that's the analysis you're talking  
 2 about? That's the dry weight you're talking  
 3 about?  
 4 A. Well, ICON's were reported in dry weight  
 5 to begin with. I'm using their data. Ours were  
 6 reported in wet weight originally. We got the  
 7 moisture contents from the lab; that gives me the  
 8 ability to convert to dry weight.  
 9 Q. That's the data you relied upon. Your  
 10 conversion is the data you relied upon for dry  
 11 weight?  
 12 A. Not just mine. No, I also relied on the  
 13 ICON data in dry weight for my dry-weight  
 14 analysis.  
 15 Q. I understand. You included that data in  
 16 your analysis; correct?  
 17 A. Yes.  
 18 Q. All right. So they talk about  
 19 preprocessing in this document. Number 1: "A  
 20 wet-soil sample typically just has the largest  
 21 stones manually picked out of the sample and  
 22 sample is digested. Outcome: This option will  
 23 provide the lowest environmentally available  
 24 metals concentration for the soil sample." Did I  
 25 read that correctly?

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1 A. Yes.  
 2 Q. Okay. Let's move on to SPLP.  
 3 At the beginning of the slide show, and  
 4 I didn't understand, so I'm just asking.  
 5 The -- when you looked at SPLP, you  
 6 looked at the areas of investigation that -- and  
 7 they're called Areas 1, 2, 3 -- not one. I can't  
 8 remember the numbers. That's the areas of  
 9 investigation that you looked at; correct?  
 10 A. Those are the areas where data was  
 11 collected. And so I'm looking at the data  
 12 collected in those areas.  
 13 Q. Okay. Did -- because I didn't see  
 14 anywhere -- is that not your areas of  
 15 investigation?  
 16 A. It's not exactly the same thing. And I  
 17 think you're talking about the -- I talked about  
 18 the preliminary AOIs. I think that's what you're  
 19 talking about. And I pointed out that, for the  
 20 direct contact evaluation, the preliminary AOI is  
 21 shown in those figures, but it is comprised of  
 22 those locations where I highlighted the exceedance  
 23 of the direct contact screening standard. So it's  
 24 shown in those tables through highlights, the blue  
 25 highlighted numbers.

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1 Q. Okay.  
 2 A. Uh-huh; right.  
 3 Q. So in your feasible plan, the blue  
 4 highlighted numbers are your areas of  
 5 investigation?  
 6 A. The blue highlighted area, the blue  
 7 highlighted numbers constitute the preliminary AOI  
 8 for direct contact purposes, for direct contact.  
 9 Q. Okay. Are there any other AOIs that I  
 10 need to be aware of besides direct contact?  
 11 A. Well, I talked about the fact that a  
 12 preliminary AOI can be identified for the  
 13 soil-to-groundwater protection evaluation.  
 14 Because we collected SPLP data at the highest  
 15 concentrations, we moved beyond defining an AOI  
 16 with that screening standard.  
 17 Q. So did you measure your AOIs or define  
 18 your AOIs to determine if SPLP was the proper  
 19 methodology to perform that analysis?  
 20 A. Well, the size of the AOI doesn't  
 21 determine if the SPLP laboratory method is an  
 22 appropriate leachate method.  
 23 Q. Let's just go to it and see what you  
 24 think. You're aware of a document that's on the  
 25 website called "RECAP 101"?

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1 A. No. I think that's a presentation.  
 2 It's a presentation.  
 3 Q. Yeah, it's called RECAP 101. It's --  
 4 A. They've given various training sessions.  
 5 Q. Yes, it's on their website, so I figured  
 6 I'd go there.  
 7 A. Right.  
 8 MR. CARMOUCHE: Show the slide.  
 9 BY MR. CARMOUCHE:  
 10 Q. And you calculated and used a DF;  
 11 correct? Not for Groundwater 3, you looked at it  
 12 for Groundwater 1 and 2; correct?  
 13 A. I'm -- no.  
 14 Q. In your chart, you're using  
 15 Groundwater 2? I think you used 45 for  
 16 Groundwater 3 --  
 17 A. -- 3.  
 18 Q. And 40 --  
 19 A. -- 40 for a groundwater screening  
 20 evaluate- -- for a soil-to-groundwater screening  
 21 evaluation, that's right.  
 22 Q. So no, not that -- it's (indicating).  
 23 So this document tells us: "A DF of 20 shall be  
 24 used" --  
 25 And what is Soil SS -- what is that?

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1 "OW"?  
 2 GW. What does that mean?  
 3 A. The soil-to-groundwater-protection  
 4 value.  
 5 Q. "A DF of 20 is considered protective of  
 6 groundwater resources for soil sources up to  
 7 .5 acre in size." So you used a 20. So is the  
 8 soil sources greater than .5 acres?  
 9 A. The direct contact -- the preliminary  
 10 direct contact AOI is bigger than a half acre.  
 11 With regard to the groundwater protection AOI, in  
 12 my opinion, the source areas, which constitute the  
 13 AOI for soil-to-groundwater protection, are not.  
 14 But this indicates the basis for that DF of 20.  
 15 And the guidance document there, the soil  
 16 screening guidance document, is the basis for that  
 17 value; however, if you then look at the  
 18 requirements for a screening option evaluation in  
 19 Appendix H, what you'll find is that it identifies  
 20 the use of the default DF of 20, regardless of  
 21 that size.  
 22 Now, it's incumbent upon the risk  
 23 assessor to determine whether or not that's  
 24 appropriate. I mean, you can't just do it and not  
 25 think about it. But the -- and I can point to the

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1 section in Appendix H, the default DF of 20 is  
 2 offered at the screening level.  
 3 Q. Just so I know and what you're telling  
 4 the panel, first the panel should assume that you  
 5 properly drew AOIs that -- protection of  
 6 groundwater; correct? You properly drew AOIs?  
 7 A. I'm not drawing an AOI relative to a  
 8 screening standard.  
 9 Q. I'm sorry.  
 10 A. Because I'm using SPLP as a groundwater  
 11 protection evaluation.  
 12 Q. You probably drew the soil sources areas  
 13 so they can look at them; correct?  
 14 A. There's not a figure that shows soil  
 15 source areas. There's not a figure. Now, that's  
 16 something I have to think about in determining  
 17 whether -- or, well, there's a couple things to  
 18 think about in determining whether using that  
 19 default value -- and it is a default -- provided  
 20 for the screening option, whether or not using  
 21 that default value is appropriate for the site.  
 22 Q. So you did -- that information, the  
 23 source area, the size, is not in your most  
 24 feasible plan; correct?  
 25 A. I didn't draw in any way a source size.

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1 It's something that I'm evaluating to make the  
 2 decision that what is allowed under MO-1 -- I'm  
 3 sorry, under screening, is appropriate for my  
 4 site.  
 5 Q. You would agree that RECAP 101 says that  
 6 you shall not use 20 if, "if" the source size is  
 7 above .5 acres in size?  
 8 A. No, that's not what it says. It  
 9 identifies that that was the basis, that was the  
 10 basis for choosing that default of 20. And if you  
 11 go to that soil screening guidance document, what  
 12 you will see is that document also says that  
 13 these -- this DAF of 20, this default factor of 20  
 14 is also protective of larger source sizes. It's a  
 15 complicated little subject matter.  
 16 But if you look at the guidance  
 17 specifically for screening option and evaluation  
 18 of leaching data, it offers the use of the default  
 19 20. So yes, I absolutely thought about whether or  
 20 not 20 is appropriate for this particular site.  
 21 In my opinion, the source sizes are likely  
 22 consistent with the historical E&P features. The  
 23 former pits, the tank batteries, those are the  
 24 likely sources, potential sources for the  
 25 constituent that we're seeing here, barium, which

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1 was then spread across the surface by the  
 2 preparation of the surface for agriculture.  
 3 In my opinion, that is the likely  
 4 sources and will represent a potential source  
 5 size. And when we look at the data; that is, the  
 6 groundwater data, relative to the soil data for  
 7 barium, it absolutely confirms that the default  
 8 factor of 20 is appropriate for this site, is  
 9 protective for this site.  
 10 Q. I'm going to end with this slide with  
 11 this.  
 12 A. Okay.  
 13 Q. "A DF of 20 is considered protective of  
 14 groundwater resources for soil sources up to  
 15 .5 acres in size." Did I read that correctly?  
 16 A. Yes. And that is the source document  
 17 that was the basis for the selection of that  
 18 dilution attenuation factor, which is allowed  
 19 under the screening option.  
 20 MR. CARMOUCHE: Can we go to the next slide?  
 21 BY MR. CARMOUCHE:  
 22 Q. Also, in RECAP 101, they have a slide,  
 23 identification of the -- I'm sorry. You would  
 24 agree that -- did you ever measure the areas that  
 25 Chevron admitted environmental damage in?

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1 A. The boxes?  
 2 Q. Yes.  
 3 A. I'm familiar with the areas.  
 4 Q. So you don't disagree with approximate  
 5 acres of those areas?  
 6 A. Right.  
 7 Q. Next slide.  
 8 So that 40 that you had on your charts,  
 9 how did you derive and then come up with 40? The  
 10 MCL times your DF of 20?  
 11 A. It's the Class 1 standard times the DF  
 12 of 20, in accordance with the Appendix H guidance  
 13 on how to evaluate leachate concentrations under  
 14 the screening option.  
 15 Q. And that would be protective of  
 16 groundwater? That's what you looked at?  
 17 A. That's the purpose of that value.  
 18 Q. All right. Let's go to the next slide.  
 19 Another slide in RECAP 101, "If the  
 20 aerial extent of soil impact is greater than  
 21 .5" -- it goes through each one -- "a  
 22 site-specific screening standard should be  
 23 calculated"; correct?  
 24 A. Yes.  
 25 Q. Okay. For Groundwater 2, did you do a

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1 site-specific screening standard?  
 2 A. So that applies, that particular  
 3 provision, the recalculation of the site-specific  
 4 screening standard applies to volatile  
 5 constituents. It doesn't apply to inorganics.  
 6 You can find that in the text of RECAP.  
 7 Q. Just for my question, did you derive or  
 8 calculate a site-specific screening standard?  
 9 A. No. That wasn't needed.  
 10 Q. Okay.  
 11 A. In accordance with RECAP.  
 12 Q. I wanted just yes or no for the record.  
 13 A. It wasn't needed.  
 14 Q. Thank you.  
 15 Almost finished. You talked about pica  
 16 babies. Do you know or have you looked into the  
 17 percentage of pica babies in the United States?  
 18 A. "Pica babies" is not an official term.  
 19 Q. Well, I'm just using the term -- pica,  
 20 whatever you call it. I might not use your  
 21 scientific term.  
 22 A. Okay.  
 23 Q. But you know what I'm talking about.  
 24 A. I think you're talking about soil pica  
 25 behavior.

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1 Q. There you go.  
 2 You talked about that earlier; right?  
 3 A. I did.  
 4 Q. Did you look into the percentage of kids  
 5 in the United States that have been diagnosed with  
 6 the -- I don't know if you want to call it a  
 7 disease or the behavior of eating dirt?  
 8 A. I'm familiar with the literature on  
 9 this. It's something that is studied in the risk  
 10 assessment guidance.  
 11 Q. Right. And have you asked around to  
 12 determine if people you know might have issues  
 13 with their kids eating dirt or sand when they go  
 14 to the beach, or maybe that's not an issue, but  
 15 that babies do this a lot? Have you done any  
 16 research to determine how -- that it's not that  
 17 unusual?  
 18 A. I've looked at the literature on this  
 19 and looked at the guidance documents on this.  
 20 Again, it's a topic that's been under discussion  
 21 for -- well, probably since the inception of risk  
 22 assessment and risk assessment methodology.  
 23 Q. So we are here for a regulatory issue  
 24 where this panel is charged with to protect the  
 25 public. And pica behavior is listed in the RECAP

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1 documents; right?  
 2 A. (Nods head.)  
 3 Q. Is that correct?  
 4 A. Yes, there's a provision to look at  
 5 pica.  
 6 Q. So you're not suggesting to this panel  
 7 that to protect everyone in Louisiana, that we  
 8 should exclude children that have pica behavior?  
 9 A. No. That's not what I'm suggesting.  
 10 What I'm suggesting is in this regulatory  
 11 program -- and this is based on my experience  
 12 implementing RECAP -- that evaluation of pica is  
 13 something that we do when there's an observation  
 14 of a particular concern, particular constituent,  
 15 its particular distribution in soil, for example,  
 16 and then there will be an examination of the  
 17 frequency, the duration to evaluate that specific  
 18 consideration. But the fact that you've raised it  
 19 for this particular site causes us to think about:  
 20 What is the potential for that being -- to just  
 21 address this question: What is the potential for  
 22 that being a concern at this site? Our  
 23 constituent of concern is barium sulfate, which is  
 24 essentially a nontoxic constituent; and for this  
 25 particular site, that's not something that

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1 required specific calculation, evaluation.  
 2 MR. CARMOUCHE: I appreciate your testimony.  
 3 Can I have one minute?  
 4 JUDGE PERRAULT: Yes.  
 5 (Discussion off record.)  
 6 MR. CARMOUCHE: That's all the questions I  
 7 have.  
 8 JUDGE PERRAULT: Do you have any redirect?  
 9 MS. RENFROE: Yes, Your Honor.  
 10 Can I have 30 seconds?  
 11 JUDGE PERRAULT: Yes, take your time.  
 12 (Discussion off record.)  
 13 MS. RENFROE: May I proceed?  
 14 JUDGE PERRAULT: Please, proceed.  
 15 MS. RENFROE: Thank you very much.  
 16 REDIRECT EXAMINATION  
 17 BY MS. RENFROE:  
 18 Q. Ms. Levert, I'm going to ask you a few  
 19 questions on some of the things that Mr. Carmouche  
 20 covered with you. Not everything, I'm sure to the  
 21 relief of the panel, but I will cover a few with  
 22 you.  
 23 So on that -- the last point regarding  
 24 the pica, Mr. Carmouche referred to it as "pica  
 25 babies," but please tell the panel so that they --

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1 so that there's no misunderstanding and that the  
 2 record is very clear. When the word "pica" is  
 3 mentioned, what is that referring to?  
 4 A. Well, it actually refers to the  
 5 hand-to-mouth activity and intentional ingestion  
 6 at an unusual rate of various substances, nonfood  
 7 substances. And then there is the topic of soil  
 8 pica. And in risk assessment, that is something  
 9 that we have been studying for a long time. It's  
 10 not a normal behavior. It's an unusual behavior.  
 11 In general, it is observed to happen in  
 12 very young children. It is considered an acute  
 13 situation usually. Sometimes it can be  
 14 sub-chronic.  
 15 Soil pica behavior is something that  
 16 typically lasts for a short period of time,  
 17 although there could be uncertainty about how  
 18 long. But many times it's just once or twice a  
 19 year, once or twice a month. It's an unusual  
 20 behavior pattern but has been studied, and we  
 21 address it as part of quantitative risk assessment  
 22 when it is identified and quantified.  
 23 Q. Now, does DNR -- based on your  
 24 experience with DNR, in your performing human  
 25 health risk assessments at oil field sites in

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1 Louisiana, has DNR ever considered pica ingestion  
 2 rates to be a default exposure rate or assessment?  
 3 A. No, not in my experience, nor does  
 4 DEQ -- well, nor does EPA. If they did, when you  
 5 pull up the EPA regional screening levels, the  
 6 RSL, instead of having the default residential  
 7 scenario like we do here in RECAP, which is the  
 8 same as EPA, then you'd have a pica number. It's  
 9 not considered reasonable maximum exposure, and  
 10 that's why it's not a default scenario.  
 11 Q. When you use this phrase "reasonable  
 12 maximum exposure," you talked about that when I  
 13 was speaking with you, but can you tell the panel  
 14 one more time how that fits into your RECAP  
 15 evaluation?  
 16 A. Yes. So this is a defined term in risk  
 17 evaluation. It's defined by EPA. EPA actually  
 18 defines the default reasonable maximum exposure  
 19 scenarios and chooses factors that are on the high  
 20 end of the range of parameters such as soil  
 21 ingestion rate; when it comes to dermal, frequency  
 22 of dermal contact, body surface area exposed  
 23 during various activities.  
 24 EPA chooses to identify what they  
 25 consider reasonable maximum exposure estimates of

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Page 501	<p>1 those various parameters and recommends them to be  2 used to make a conservative estimate of risk for a  3 reasonable maximum exposure scenario for  4 industrial scenarios, for residential scenarios.  5 And that is what we are required to use, those  6 high-end estimates that estimate reasonable --  7 maximum reasonable exposure possibilities.  8 Q. Has DNR, in connection with your work on  9 oil field sites, whether in a most feasible plan  10 setting or otherwise, has DNR ever directed you or  11 requested that you use a pica ingestion rate in  12 your evaluation of potential human health risk?  13 A. No.  14 Q. And in any of the most feasible plans  15 that DNR has ever issued, to your knowledge, has  16 DNR ever used a pica ingestion rate?  17 A. No.  18 Q. Now, in Mr. Carmouche's questions to  19 you, did he present you with any evidence that --  20 of any pica exposure at the Henning Management  21 property?  22 A. No.  23 Q. Switching to another topic, the topic of  24 wet weight versus dry weight. He showed a number  25 of documents or excerpts from a number of</p>	Page 503	<p>1 Q. So this is a bit of a nonissue?  2 A. It's a nonissue.  3 Q. And with respect to those, I think you  4 said, seven or eight most feasible plans that you  5 have provided a RECAP risk assessment for, did you  6 always submit your data in wet weight?  7 A. Yes. And probably in every one of them,  8 I also submitted it in dry weight.  9 Q. Okay. And so that's what I wanted to  10 ask you about regarding the wet weight versus dry  11 weight.  12 Let's also talk about the SPLP  13 questions. Tell the panel just once more what  14 RECAP calls for, the actual promulgated version of  15 RECAP, the effective version of RECAP that you  16 used, what does it call for with respect to SPLP  17 data?  18 A. Well, it simply provides the provision  19 to use that methodology for performing a  20 site-specific groundwater protection evaluation.  21 And in practice as well as some of the language in  22 the RECAP document, they encourage the use of SPLP  23 because it's more site-specific than simply using  24 a theoretical calculation; right, of partitioning  25 between soil and water.</p>
Page 502	<p>1 documents, starting with a 2016 draft of RECAP and  2 comments on that. Was the 2016 draft of RECAP  3 ever adopted?  4 A. No.  5 Q. Was the 2019 version of RECAP that he  6 showed you with some comments on it, was that  7 adopted?  8 A. No.  9 Q. And so which version of RECAP did you  10 use for your human health risk assessment in this  11 Henning Management case?  12 A. I used the 2003 version. I used the  13 guidance there for which units to identify risks  14 for direct contact. However, in light of my  15 knowledge of the broader information from EPA and  16 other guidance documents, I also used dry weight.  17 RECAP 2003 is what I used to provide the primary  18 evaluation.  19 Q. Once again, going back to your years of  20 experience with DNR, evaluating potential for  21 human health risk at oil field sites, if DNR wants  22 you to provide data in dry weight, can they ask  23 you for it?  24 A. Absolutely. I usually provide it in  25 both to DNR. I usually provide both.</p>	Page 504	<p>1 Q. So with respect to this issue around  2 pica ingestion, wet weight versus dry weight and  3 SPLP data, have you now told the panel about what  4 the -- the current and effective version of RECAP  5 requires?  6 A. I believe so.  7 Q. You were asked some questions about East  8 White Lake, or the Vermilion Parish case. I think  9 that's one of the areas where Mr. Carmouche  10 started off with you.  11 A. (Nods head.)  12 Q. Now, did you submit a RECAP human health  13 risk evaluation to DNR in connection with the  14 Vermilion Parish School Board case?  15 A. Yes.  16 Q. And did --  17 A. Lovingly known as East White Lake.  18 Q. Did you conclude in that case that there  19 was no human health risk beyond the area of  20 sediment that UNOCAL proposed to remediate?  21 A. I identified a couple of locations in  22 soil: One at a tank battery, one in the operating  23 industrial area, that warranted corrective action  24 and those actions have been implemented. The one  25 in the operational area has not. Now, that</p>

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<p>1 concentration, I found to be protective of an  2 industrial scenario but not a nonindustrial  3 scenario. So until the operations are  4 discontinued, that condition will stay as is. But  5 following operations, it will be reevaluated.  6 Q. Okay. Now, last thing I want to ask you  7 about.  8 MS. RENFROE: And I'd like to go to the Elmo,  9 please, Jonah.  10 BY MS. RENFROE:  11 Q. Mr. Carmouche showed you some provisions  12 from 3029. And he showed you specifically the  13 definition of "contamination" and the definition  14 of "environmental damage." Do you recall that?  15 A. Yes.  16 Q. I'm now going to show you the definition  17 of "feasible plan."  18 And do you see here that "feasible plan"  19 means "The most reasonable plan which addresses  20 environmental damage in conformity with the  21 requirements of article 9, Section 1 of the  22 constitution of Louisiana to protect the  23 environment, public health, safety and welfare and  24 is in compliance with the specific relevant and  25 applicable standards and regulations promulgated</p>	<p>1 Q. So in the RECAP risk assessment that  2 you've provided in support of the Chevron most  3 feasible plan, did you perform that risk  4 assessment based on applicable standards and  5 regulations?  6 A. Yes.  7 Q. And is it your conclusion, based on that  8 RECAP human health risk evaluation, that the most  9 feasible plan submitted by Chevron to the DNR is  10 protective of human health and the environment and  11 the public welfare?  12 A. Based on my analysis and in accordance  13 with that regulation, yes, that is my opinion.  14 Q. And as between the Henning Management  15 most feasible plan and the Chevron most feasible  16 plan, is the Chevron most feasible plan the most  17 reasonable of the two?  18 A. Well, in my opinion, it is because it  19 incorporates the full evaluation of the protection  20 of public health, safety, yes.  21 Q. Now, based on all of your review of the  22 site data, the site information, characterization  23 of the site, all of the information you've seen  24 from the Henning Management plaintiff and ICON and  25 any information that you've seen from the</p>
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<p>1 by a state agency in accordance with the  2 administrative procedure act in effect at the time  3 of cleanup to remediate contamination resulting  4 from oil field or exploration and production  5 operations or waste." You've seen this definition  6 of a feasible plan before, haven't you?  7 A. Yes.  8 Q. So is it your understanding that a most  9 feasible plan issued by DNR has to be reasonable,  10 has to be the most reasonable plan?  11 A. Yes.  12 Q. Is it also your understanding that it  13 has to be protective of human health and the  14 environment?  15 A. Yes.  16 Q. And protect the public welfare?  17 A. Yes.  18 Q. And third, is it your understanding that  19 it has to be based upon application of, quote,  20 applicable standards and regulations?  21 A. Yes, and I believe that's the reason for  22 my role and my evaluation in these admission plans  23 that we are providing to the agency, specifically  24 to use the current applicable regulation to  25 evaluate protection of public health.</p>	<p>1 plaintiffs' side as well as from the Chevron side  2 of the case, have you seen any evidence  3 whatsoever, Ms. Levert, that justifies any  4 remediation to be done at the Henning Management  5 property for the protection of human health?  6 A. Not for the protection of human health.  7 MS. RENFROE: Thank you. Those are all the  8 questions I have.  9 JUDGE PERRAULT: The only evidence you  10 submitted under this witness was Exhibit 145,  11 which was admitted. Is there any other  12 evidence that y'all had?  13 MS. RENFROE: Exhibit 1 was already --  14 JUDGE PERRAULT: 145.  15 MS. RENFROE: Her report -- 145 is her CV.  16 JUDGE PERRAULT: Right. That's the only one  17 we admitted under her?  18 MS. RENFROE: That's correct.  19 JUDGE PERRAULT: Okay. Just wanted to make  20 sure.  21 MS. RENFROE: Your Honor, before we depart, I  22 would like to request Mr. Carmouche to give  23 us a copy of the slides that he used with  24 Ms. Levert on cross-examination.  25 JUDGE PERRAULT: He'll do that.</p>

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<p>1 Do y'all have any questions of this</p> <p>2 witness? Does the panel have any questions?</p> <p>3 PANELIST OLIVIER: If we could take a</p> <p>4 ten-minute break so we can discuss.</p> <p>5 JUDGE PERRAULT: All right. We'll take a</p> <p>6 ten-minute break so y'all can decide.</p> <p>7 Go off the record, please.</p> <p>8 (Recess taken at 3:55 p.m. Back on record</p> <p>9 at 4:15 p.m.)</p> <p>10 JUDGE PERRAULT: We're back on the record.</p> <p>11 The panel has returned. Do you have any</p> <p>12 questions for this witness?</p> <p>13 PANELIST OLIVIER: Yes, we do.</p> <p>14 JUDGE PERRAULT: Please proceed. State your</p> <p>15 name for the record.</p> <p>16 PANELIST OLIVIER: Stephen Olivier.</p> <p>17 Hey, Ms. Levert. This was kind of</p> <p>18 brought up with Ms. Connelly about the</p> <p>19 landowner. I know ICON's report and also,</p> <p>20 too, the landowner's representatives</p> <p>21 mentioned about ponds on the property, as you</p> <p>22 recall.</p> <p>23 And then they mentioned potentially</p> <p>24 installing a pond maybe in one of the AOIs.</p> <p>25 They mentioned potentially a depth of</p>	<p>1 risk to human health, would still apply if</p> <p>2 they were to install a pond on one of the</p> <p>3 AOIs, as they suggested?</p> <p>4 THE WITNESS: That is my opinion.</p> <p>5 PANELIST OLIVIER: Okay. One additional</p> <p>6 question. We noticed in one of ICON reports</p> <p>7 on behalf of the plaintiff, they mentioned,</p> <p>8 in Area 2 on the blowout area where there's</p> <p>9 an existing -- where they're calling a pond,</p> <p>10 they mentioned it's more of a bottom-up</p> <p>11 contaminated area there, which is a little</p> <p>12 different than everywhere else, where we see</p> <p>13 more contamination on the surface. Did you</p> <p>14 take that into consideration with your</p> <p>15 evaluation as well? And you know, did that</p> <p>16 change any conclusion or are you still</p> <p>17 concluding the same as you already cited</p> <p>18 today?</p> <p>19 THE WITNESS: So I'm glad you asked that</p> <p>20 because we looked at that very closely, and</p> <p>21 Dave Angle will talk about that a lot because</p> <p>22 as part of my human health risk assessment,</p> <p>23 of course, I was very interested in</p> <p>24 protection of the USDW, the zone that I</p> <p>25 believe really does provide a potential water</p>
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<p>1 25 feet.</p> <p>2 And so our question to you is: Was that</p> <p>3 considered in your evaluation? And if it</p> <p>4 was, did it make any difference? Is your</p> <p>5 conclusion still the same as you've already</p> <p>6 cited today?</p> <p>7 THE WITNESS: That isn't something that we</p> <p>8 quantitatively evaluated. There was not a</p> <p>9 suggestion of a pond of that size, for</p> <p>10 example. But from a conceptual model</p> <p>11 perspective, when I contemplate that sort of</p> <p>12 scenario and think about the volume of water</p> <p>13 that would be in that kind of feature and</p> <p>14 think about, for example -- just assuming</p> <p>15 that there were to be some sort of contact</p> <p>16 with the groundwater with a pond that were</p> <p>17 that deep, just given the volume of water,</p> <p>18 the dilution associated with the two</p> <p>19 constituents that we would be interested in a</p> <p>20 human health concern about, that being</p> <p>21 benzene and barium, gosh, that would not</p> <p>22 create any sort of a concern for human health</p> <p>23 with regard to being present in surface</p> <p>24 water.</p> <p>25 PANELIST OLIVIER: And so your conclusion, no</p>	<p>1 supply. It does elsewhere -- actually on</p> <p>2 this property and elsewhere.</p> <p>3 And through our vertical delineation,</p> <p>4 through our examination of the confining unit</p> <p>5 characteristics, we don't see evidence of a</p> <p>6 bottom-up scenario.</p> <p>7 Now, the concentrations that we see in</p> <p>8 the shallow groundwater zone and the chemical</p> <p>9 signature that resembles produced water, we</p> <p>10 believe that was a result of the blowout and</p> <p>11 fluid that arrived there from the surface or</p> <p>12 from near the surface where the actual</p> <p>13 mechanism failed. And we talked to our ops</p> <p>14 person about this, too, to help us understand</p> <p>15 the likelihood of a bottom-up. He explained</p> <p>16 to us where the mechanism failed. Through</p> <p>17 our evaluation of all of the data regarding</p> <p>18 the distribution of constituents and the</p> <p>19 hydrogeology and the lithology, we don't see</p> <p>20 evidence of the bottom-up, and we do think we</p> <p>21 understand why the produced water signature</p> <p>22 remains at that blowout location.</p> <p>23 PANELIST OLIVIER: Okay. I think that</p> <p>24 answers my question, and we don't have any</p> <p>25 other questions from the panel.</p>

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<p>1 JUDGE PERRAULT: Thank you very much.  2 THE WITNESS: Thank you.  3 JUDGE PERRAULT: If there's nothing further,  4 we're adjourned until tomorrow morning at  5 9:00 o'clock. And we're off the record.  6 (Hearing adjourned at 4:19 p.m.)  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25</p>	<p>1 REPORTER'S CERTIFICATE  2 I, Dixie Vaughan, Certified Court  3 Reporter (Certificate #28009) in and for the State  4 of Louisiana, as the officer before whom this  5 testimony was taken, do hereby certify that on  6 Tuesday, February 7, 2023, in the above-entitled  7 and numbered cause, the PROCEEDINGS, after having  8 been duly sworn by me upon authority of R.S.  9 37:2554, did testify as hereinbefore set forth in  10 the foregoing 242 pages;  11  12 That this testimony was reported by me  13 in stenographic shorthand, was prepared and  14 transcribed by me or under my personal direction  15 and supervision, and is a true and correct  16 transcript to the best of my ability and  17 understanding;  18  19 That the transcript has been prepared in  20 compliance with transcript format guidelines  21 required by statute or by rules of the board;  22  23 That I have acted in compliance with the  24 prohibition on contractual relationships, as  25 defined by Louisiana Code of Civil Procedure</p>
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<p>1 REPORTER'S PAGE  2 I, DIXIE VAUGHAN, Certified Court  3 Reporter in and for the State of Louisiana, (CCR  4 #28009), as defined in Rule 28 of the Federal  5 Rules of Civil Procedure and/or Article 1434(B) of  6 the Louisiana Code of Civil Procedure, do hereby  7 state on the Record:  8 That due to the interaction in the  9 spontaneous discourse of this proceeding, dashes  10 (--) have been used to indicate pauses, changes in  11 thought, and/or talkovers; that same is the proper  12 method for a Court Reporter's transcription of  13 proceeding, and that the dashes (--) do not  14 indicate that words or phrases have been left out  15 of this transcript;  16 That any spelling of words and/or names  17 which could not be verified through reference  18 material have been denoted with the phrase  19 "(phonetic)";  20 That (sic) denotes when a witness stated  21 word(s) that appears odd or erroneous to show that  22 the word is quoted exactly as it stands.  23  24 DIXIE VAUGHAN, CCR  25</p>	<p>1 Article 1434 and in rules and advisory opinions of  2 the board;  3  4 That I am not of Counsel, nor related to  5 any person participating in this cause, and am in  6 no way interested in the outcome of this event.  7  8 SIGNED THIS THE 24TH DAY OF FEBRUARY,  9 2023.  10  11  12  13 DIXIE VAUGHAN  14 Certified Court Reporter (LA)  15 Certified LiveNote Reporter  16  17  18  19  20  21  22  23  24  25</p>